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Normal and Ischemic Myocardial Transport Kinetics for
Bis(N-ethoxy, N-ethyl Dithiocarbamato) Ditrido Technetium-99m (NOET)

by

Terrance A. Harms
B.S., South Dakota State University (1987)

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
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ABSTRACT OF A THESIS SUBMITTED TO THE FACULTY OF THE
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ABSTRACT

Recently a new Tc-99m labeled compound, bis(N-ethoxy, N-ethyl dithiocarbamato) nitrido Tc-99m, or NOET, has been designed to evaluate regional myocardial blood flow and cellular viability.[2,3,4] Previous studies of NOET indicate that it has the potential for use as a perfusion agent for assessing myocardial viability. These studies, however, were not designed to evaluate the actual kinetics of this agent. In the present study, Thermoluminscent Dosimeter (TLD) analysis was used in a rabbit model to assess the transport kinetics of NOET in normal and ischemic myocardium. The final rate constants for clearance in the normal and ischemic regions were 7.58E-4 +/- 1.1E-4 (1σ) minutes^{-1} and 9.59E-4 +/- 3.6E-4 (1σ) minutes^{-1}, respectively. These compare to the arterial clearance rate constant of 4.81E-3 +/- 1.2E-3 (1σ) minutes^{-1}. Therefore, findings indicate that NOET has the potential to assess myocardial viability.

ACKNOWLEDGEMENT

The author is extremely grateful to the staff of the Department of Nuclear Medicine and Medicine (Cardiovascular Division), University of Massachusetts Medical Center for the opportunity to work with them. A special thanks to Dr. Christopher Reinhardt for his guidance and advice, to Robin Marcel for her technical and surgical assistance, and to Dr. Thomas Holly for allowing me to partake in his research. Thank-you to the Radiological Sciences Faculty at University of Massachusetts-Lowell for sound instruction and support during my post-graduate work. To his wife, Susan, for her outstanding encouragement, he sends his love.

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I. INTRODUCTION:

Radiolabeled tracers and compounds are used frequently to assess coronary artery disease. Thallium-201 has been the tracer of choice since its kinetics can describe both regional blood flow and cellular viability. Reduced image quality, due to low photon energy of Tl-201, and relatively high patient dose, due to its long effective half-life, have propelled research to design an alternative radiolabeled tracer for evaluating coronary artery disease.[1,2]

Technetium-99m has a higher energy photon and shorter physical half-life than Tl-201. Theoretically, Tc-99m labeled compounds would result in better image quality while reducing patient dose. Several Tc-99m labeled compounds have been developed and are commercially available to assess regional myocardial blood flow. Recently, a new Tc-99m labeled compound, bis(N-ethoxy, N-ethyl dithiocarbamato) nitrido Tc-99m, or NOET, has been designed to evaluate both regional myocardial blood flow and cellular viability in a manner similar to ^{201}Tl.[2,3,4] To determine NOET's clinical potential, its myocardial clearance kinetics must be thoroughly understood. This study was designed to evaluate NOET's transport kinetics in normal and ischemic myocardium using an *in vivo* rabbit model with a recently developed technique using thermoluminscent dosimeters.[5]

II. METHODOLOGY:

A. SURGICAL TECHNIQUE:

All procedures were performed at the University of Massachusetts-Medical Center and were performed in accordance with the Center's Animal Medicine guidelines. On separate occasions, six New Zealand White male rabbits (Millbrook Farms, Amherst, Ma.) were anesthetized with 1-2% isoflourane administered *via* an anesthesia apparatus (Boyle Model 50, Harris-Lake Inc., Cleveland, OH). For each experiment, the carotid artery was catheterized and arterial pressure continuously recorded. Supplemental oxygen was used to maintain physiological arterial blood gases (pH 7.32-7.70, arterial pO >100mm Hg and pCO_2 28-46 mm Hg). Both femoral arteries were catheterized. One line was used to draw reference samples for microsphere determination of regional myocardial blood flow. The other line was used to measure arterial pH, pCO_2, pO and tracer blood activity. The heart was exposed in a pericardial cradle through a left thoracotomy. A catheter was inserted into the left atrium to inject radiolabeled microspheres while a catheter in an ear vein was used to inject the experimental compound (NOET).

B. EXPERIMENTAL TECHNIQUE:

Radioactive microspheres (Cr-51) were injected through a left arterial catheter and a three minute reference blood sample was drawn from the femoral arterial catheter using an infusion pump (Havard Apparatus, Mills, MA) to document normal (pre-occlusion) blood flow. A large branch artery of the left circumflex was occluded. The

area above the occlusion was designated as the normal region and the area below the occlusion as the ischemic region. A second set of radioactive microspheres (Ru-103) was then injected with a concurrent withdrawal of a three minute blood sample to document occlusion flow. The NOET was injected immediately after the collection of the second microsphere sample (approximately 4 minutes post occlusion). Measurements of the myocardium activity and arterial blood withdrawal started 30 seconds after tracer injection. Relative activities in the myocardium regions were determined by placing a TLD on the myocardial wall. Arterial blood was drawn at various intervals to measure left ventricular blood activity during TLD exposure. Fifteen minutes post occlusion, the left circumflex artery was released to allow reperfusion in the ischemic region. A third set of radioactive microspheres (Nb-95) was then injected with a concurrent withdrawal of a three minute blood sample to document post-occlusion flow. After 3 hours of regional TLD measurements, the heart was removed and evaluated for microsphere and tracer activity distributions. The TLDs were measured for relative light output and this information was used to assess myocardial tracer clearance kinetics.

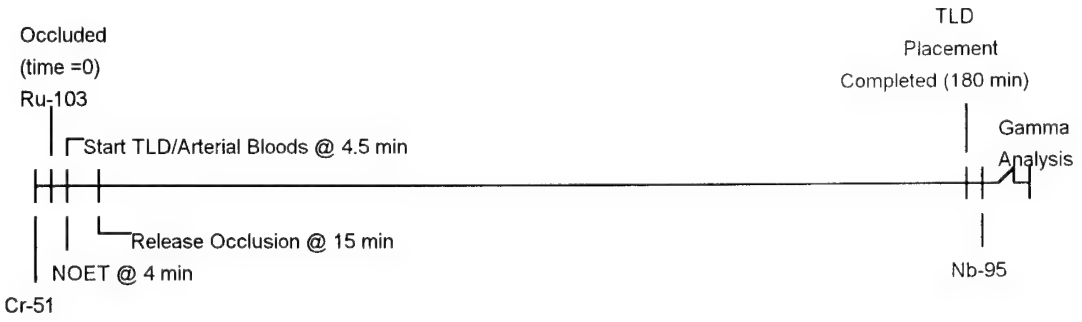

Figure 1: Time line for Ischemic Evaluation of NOET Using TLD Technique

(1) ARTERIAL BLOOD CLEARANCE

Arterial blood clearance kinetics for each rabbit was determined and used to obtain an estimate of background activity present in the left ventricle at any point in time.

Arterial blood samples (2 ml) were taken 30 seconds after the NOET injection, and then every minute post injection for the first 10 minutes, every 5 minutes from 10 to 30 minutes and every 15 minutes from 30 to 180 minutes post injection. Each blood sample was weighed and the Tc-99m specific activity determined using a NaI(Tl) gamma counter (Auto Gamma 5530, Packard Instruments Co., Downers Grove, Ill). Results were expressed in dpm/mg.

The activity for each arterial blood sample was decay-corrected to its collection time following injection of NOET.

$$A = R * \exp(-\lambda(t_c - t_i)) * \exp(\lambda T) / \varepsilon \qquad \text{(Equation 1)}$$

A - Activity in dpm

R - Count rate in cpm

λ - decay constant (1/min)

t_c - elapsed time from start of occlusion to collection blood (min)

t_i - elapsed time from start of occlusion to injection (min)

T - elapsed time from start of occlusion to activity analysis (min)

ε - efficiency of the gamma well counter (0.62 c/d)

Specific blood activity (dpm/mg) was determined for each sample and plotted against time.

(2) TLD MEASUREMENTS

The CaF_2 TLDs were annealed for four hours at 420°C with an annealing oven (Model 2600-62, Victoreen, Inc., Cleveland, OH). Each TLD then was placed into a numbered opaque test tube. Background light output was measured for each TLD using a Victoreen TLD Reader, Model 8800, to ensure proper annealing. The TLDs then were placed back into numbered, opaque test tubes. The next day, the first TLD was placed on the normal myocardial region 30 seconds post tracer injection. The second TLD was

placed on the ischemic myocardial region 30 seconds after the placement of first TLD. The TLDs were removed and returned to the opaque test tube following a 2 minute timed exposure. The placement of the next set of TLDs occurred 90 seconds after the removal of the ischemic region TLD. To obtain sufficient information on the myocardium clearance, this sequence of TLD placement continued for 180 minutes generating 46 normal TLD measurements and 46 ischemic TLD measurements. After the experimental protocol, the exposure recorded by the TLD was measured *via* a TLD reader (Victoreen Model 8800) and expressed in units of relative light output.

The measured activity (μCi) for each TLD was determined by using the equation:

$$A = (L - 1178) / 2096 \qquad \text{(Equation 2)}$$

L - light output of TLD

This equation is from the calibration curve previously developed by Reinhardt *et al.*[5]

Because this measurement includes activity detected in the myocardium and background, correction for background activity was made. The Correction Model presented by Reinhardt *et al.*[5] was used to estimate background activity. The ALV is the activity in the left ventricle during exposure of the TLD. As long as the change in the arterial blood activity is small during the interval of exposure, the ALV will equal the product of the volume and the activity concentration of the arterial blood during exposure time. However, when the change is drastic over the two-minute TLD exposure time, a mean value will contribute to the TLD which can be found by integrating the arterial blood clearance curve over exposure time and then dividing by the time interval. Therefore, ALV was determined by

$$ALV = V*\rho*\{a/b*\exp(-bt_c)*[1-\exp(-bt_c)] + c/d*\exp(-dt_c)*[1-\exp(-dt_c)]\}/t_c \qquad \text{(Equation 3)}$$

ALV - Activity in left ventricle at any time t_c (dpm)

V - volume of left ventricle (1.187 ml)

ρ - blood density (1060 mg/ml)

t_e - TLD exposure time (2 minutes)

t_c - elapsed time from start of occlusion to placement of TLD (min)

a,b,c & d - parameter of the bi-exponential fit of blood curve
(Reference Figures 5, 10, 15 and 20 in Appendices)
- a & c have units of dpm/mg
- b & d have units of min^{-1}

Reinhardt *et al.*[5] also developed an attenuation curve representing the integrated activity contributions from a thick source as measured by a single TLD. Estimated background activity measured by the TLD then was determined by using the attenuation curve multiplied by the ALV (assuming the activity in the left ventricle is uniformly distributed). Therefore, TLD activity ($A_{measured}$) is

$$A_{measured} = ALV*[14.686 \exp(-33.968x) + 0.405 \exp(-4.232x)] \qquad \text{(Equation 4)}$$

Integrating equation 4 over the limits of the intraventricular diameter (0.4 - 1.2 cm for normal region and 0.2 - 1.4 cm for ischemic region) approximates the background contribution measured by the TLD.

(3). MYOCARDIAL BLOOD FLOW MEASUREMENTS

Blood flow was evaluated by three separate injections of microspheres as described by Heyman *et al.*[6] After 180 minutes post injection, the animals were sacrificed. The hearts were removed and rinsed with normal saline solution. The left ventricle was isolated and then frozen for dissection. Dissected segments (40 mg) were placed in a warm bath of nitro blue tetrazolium (NBT) for 5 minutes to assess segment viability. A blue precipitate will form on normal, viable tissue, and non-viable tissue will fail to stain blue. Activity concentration in each segment was measured using a NaI(Tl)

gamma counter (Auto Gamma 5530, Packard Instruments Co., Downers Grove, Ill). Corrections were made for radionuclide crossover and decay. Results were expressed in dpm/mg.

The activity concentration in each reference blood sample was measured using a NaI(Tl) gamma counter (Auto Gamma 5530, Packard Instruments Co., Downers Grove, Ill). Results for reference blood samples were expressed in dpm/ml. This result was used to obtain absolute myocardial blood flow measurement for each segment

The absolute blood flows (ml/min/g) were determined by normalizing the myocardial microsphere content of each segment to the microsphere content in the 3-minute reference blood sample as follows:

$$F = (A_{segment}/m_{segment}) / (A_{blood}/f_{pump}) \qquad \text{(Equation 5)}$$

$A_{segment}$ - Activity of segment (dpm)

$m_{segment}$ - mass of segment (g)

A_{blood} - Total activity in reference blood sample (dpm)

f_{pump} - flow rate of pump (volume collected / collection time)

III. RESULTS

A. SURGICAL EVALUATION

Surgeries lasted 240 +/- 15 minutes. Blood gas measurements and hemodynamics for each were maintained in the normal physiologic range. No significant changes from the base line values were observed. Arterial blood flow measurements demonstrated that experiment 950719 failed to occlude properly and therefore was rejected. Experiment 950721 showed areas of infarction during the viability test and also was rejected. The total sampling population of four remained and was used to assess regional clearance kinetics of NOET.

B. ARTERIAL BLOOD ACTIVITY

The arterial blood specific activity history was tabulated for each experiment and can be found in the appendices. Figure 1 shows the clearance for experiment 950726. A bi-exponential fit was used to describe the clearance rate of the arterial blood. This information then was used to estimate background activity from the left ventricle.

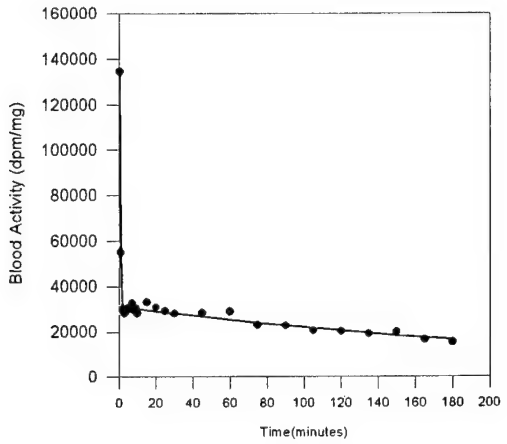

Figure 2: Blood Clearance Activity Fitted to Bi-exponential [y=459483 exp(-2.98x)+31385 exp(-3.50E-3x)]

C. MYOCARDIUM ACTIVITY (TLD MEASUREMENTS)

The measured myocardial activities from the TLD measurements were normalized to the first normal TLD measurement. Tabulated data can be found in the appendices. Figure 2 is an example plot of the normalized activity for the normal and ischemic regions. Plots for all experiments can be found in appendices. Table 1 shows the final clearance rate for normal, ischemic and blood clearance curves.

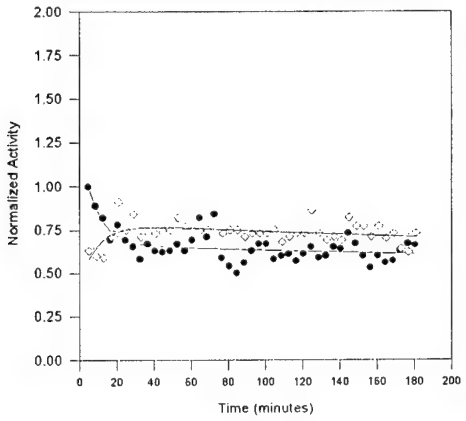

Figure 3: Myocardial Clearance of NOET in the Normal and Ischemic Regions. Normal myocardial clearance of NOET is bi-exponential with final removal rate of 4.5E-4 min^{-1} (solid circles). Ischemic myocardial clearance of NOET indicated a build-up period after release of occlusion and a final removal rate of 5.96E-4 min^{-1} (hollow diamonds).

Table 1

Final NOET Clearance Rate Constants in a Rabbit Model

Experiment	Blood (1/min)	Normal Region (1/min)	Ischemic Region (1/min)
950726	3.50E-03	4.50E-04	5.96E-04
950728	8.73E-03	7.08E-04	1.84E-03
950731	4.34E-03	1.03E-03	4.41E-04
950906	2.67E-03	8.42E-04	5.70E-12 (a)
mean	4.81E-03	7.58E-04	9.59E-04
s.d.	2.67E-03	2.44E-04	1.14E-04

(a) Was not used in calculation of mean and standard deviation

D. MYOCARDIAL BLOOD FLOW MEASUREMENTS

Figure 3 and figure 4 show the comparison of reference blood flows and Tc-99m distribution for experiment 950726. Tabulated information can be found in the appendices. In all experiments, the distribution of the microspheres were as expected.

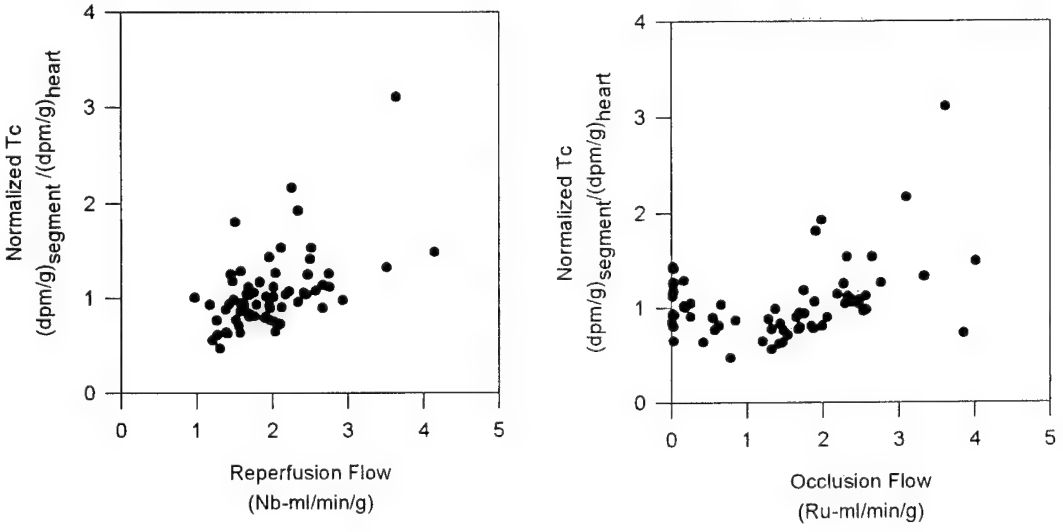

Figure 4: Above graphs are comparisons of Tc-99m distribution in each heart segment to the reference blood flows in the segment for Experiment 950726. a. Plot of normalized Tc vs reperfusion flow b. Plot of normalized Tc vs occlusion flow.

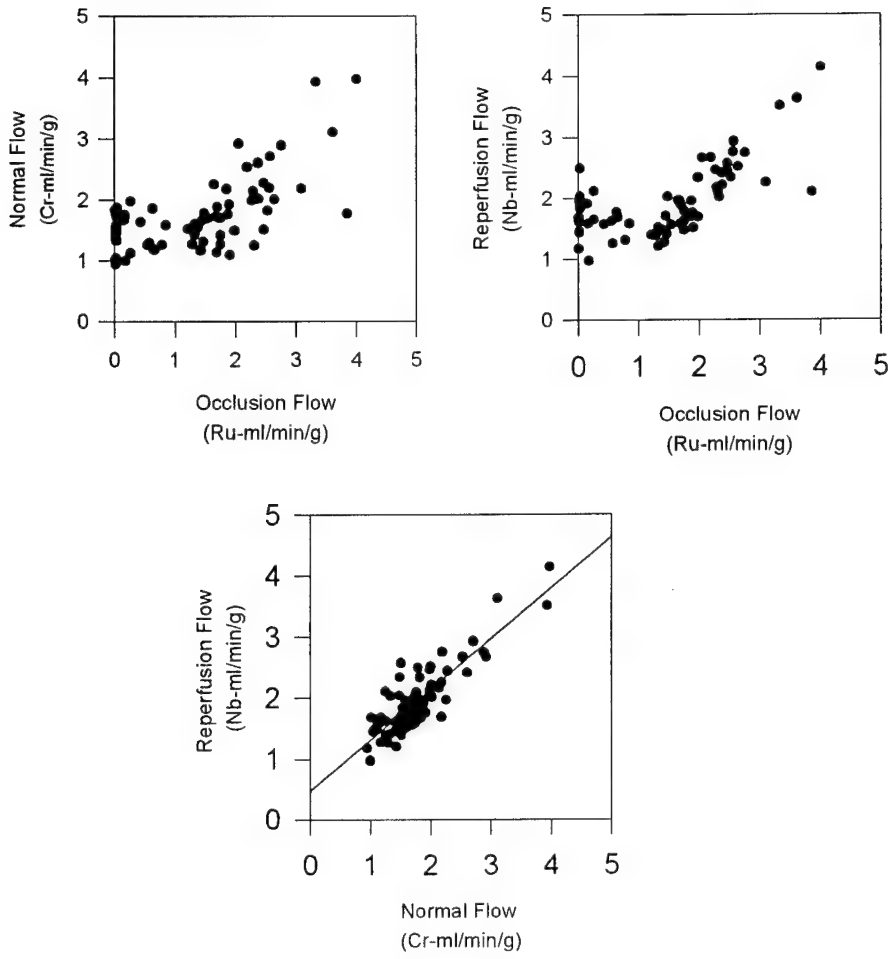

Figure 5: Above graphs are comparisons of the reference blood flows for Experiment 950726. a. Plot of normal reference blood flow vs occlusion flow. b. Plot of reperfusion flow vs occlusion flow, c. Plot of reperfusion flow vs normal flow.

IV. DISCUSSION

In determining myocardium viability in a clinical setting , a radioactive tracer, such as NOET, must redistribute in exercise-induced ischemic regions and must have a slow removal rate from the myocardium.[7] This study was specifically designed to measure NOET's ability to redistribute in ischemic myocardium. A technique using a series of TLD's in an *in vivo* rabbit model was used for this purpose.[5]

The TLD technique used in this study was recently developed by the University of Massachusetts-Medical Center. This technique is simple and should be encouraged.

Advantages of the TLD technique included cost and ease of measurements. The cost advantage was previously discussed by Reinhardt *et al.* [5] Briefly, smaller animals cost less then larger animals, and this technique was developed for smaller animals. TLD measurements simply require exposing TLDs and then reading light output on a TLD reader. This light output then can be converted to activity by a calibration curve for TLD type and reader.

Reinhardt et al presented a correction model for background. This model was developed by stacking series of TLDs upon a thin source. The reciprocity theorem was then used to estimate the activity contribution from a thick source to a TLD. However, this relationship is only exact in an infinite homogeneous medium and for primary radiation.[8] Theoretically, the background correction used in this study would overestimate the background activity. Because the background activity contributed little to overall TLD measurement by using the Reinhardt et al model, the correction model was not changed for this study. Therefore, this overestimate for background was subtracted from the TLD measurement to obtain an estimate of the myocardium activity.

In other techniques (*i.e.* gamma imaging), myocardium activity cannot be separated from that of blood in the left ventricle. Therefore, myocardial activity in other evaluation techniques is determined by sacrificing the animal at the desired time. However, the myocardium activity can be estimated at any time point during an experiment by using the TLD method with the appropriate background correction.

A disadvantage to this method is time spent in placing TLD's on the myocardium and into the TLD reader. Automating the TLD reader would be beneficial in cutting man-hours. Though labor time may be higher with this method, the simplification, low cost and ability to determine myocardium activity at various time points give this technique great merit.

The results of this study showed that measured myocardium clearance rates were not significantly different for normal (7.58E-4 +/- 2.4E-4) and ischemic (9.59E-4 +/- 1.1E-4) regions after 15 minutes post occlusion. Therefore, NOET appeared to redistribute with blood flow in this ischemic model. The slow tracer removal rate from 30 to 180 minutes post injection further suggests that this agent will allow for constant myocardial imaging in the clinical setting. This slow removal rate is consistent with previous studies involving a dog model.[4]

Absolute blood flows were measured at three time points using radiolabeled microspheres to identify the normal and occluded regions. During occlusion, the microsphere measurements showed little to no flow in the ischemic region being assessed by TLD's. Moreover, normal myocardial blood flow was restored following release of the occluder. Microsphere measurements also demonstrated that normal blood flow was maintained throughout the experiment duration in regions being assessed for normal myocardial clearance kinetics.

V. CONCLUSION

Myocardial perfusion agents (tracers) are used to assess coronary artery disease. It is desirable to maintain the patient dose as low as reasonably possible while maintaining image quality. Thallium has been the tracer of choice since its kinetics can describe regional blood flow and cellular viability. In this study NOET's transport kinetics have demonstrated perfusion in normal and reperfusion in ischemic regions of myocardium. Therefore, NOET has to be equivalent to thallium as a perfusion agents.

VI. RECOMMENDATIONS

This study was set up to obtain preliminary information on NOET kinetics. However, the method used for the evaluation was recently developed and therefore recommendation for methodology and future of NOET are given.

The TLD method, though simple, could be improved. A control TLD should be used to ensure no unusual exposure to the TLD's. This would provide quality control and allow for recognition of possible false readings. As mentioned earlier if the TLD reader could be automated, man-hours could be reduced.

The background correction model for arterial blood activity should also be changed. A more appropriate method would be to vary a stack of thin sources upon a TLD. The media that the thin source is distributed on should have a mass attenuation coefficient equivalent to that of tissue. Presently, this correction model is under investigation and should be reported at a later date.

Future studies need to be performed on NOET before it can be considered as a clinical alternative to Thallium. As this paper was being written, an infarct rabbit model was being evaluated. With the data presented in this paper and the data obtained from the infarct study, future clinical studies can be built to determine if indeed NOET can become a useful clinical myocardial reperfusion agent.

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Appendix 1

Data Tables and Illustrations for Experiment 950726

TABLE 2

BLOOD CLEARANCE FOR EXPERIMENT 950726.

Sample #	Lapse Time HH:MM:SS	Measurement CPM	Corrected (a) DPM	Tube-Blood Mass in g	Tube Mass g	Blood Mass g	Calculated dpm/mg	Fit Data dpm/mg
1	0:04:30	**1.86E+06**	4.77E+07	**3.05E+00**	**2.70E+00**	3.54E-01	1.35E+05	1.35E+05
2	0:05:00	**7.60E+05**	1.95E+07	**3.05E+00**	**2.70E+00**	3.55E-01	5.49E+04	5.45E+04
3	0:06:00	**5.00E+05**	1.28E+07	**3.14E+00**	**2.71E+00**	4.27E-01	3.00E+04	3.23E+04
4	0:07:00	**3.59E+05**	9.16E+06	**3.01E+00**	**2.69E+00**	3.26E-01	2.81E+04	3.11E+04
5	0:08:00	**4.12E+05**	1.05E+07	**3.07E+00**	**2.71E+00**	3.59E-01	2.92E+04	3.09E+04
6	0:09:00	**4.15E+05**	1.06E+07	**3.02E+00**	**2.68E+00**	3.43E-01	3.08E+04	3.08E+04
7	0:10:00	**3.55E+05**	9.01E+06	**2.98E+00**	**2.69E+00**	2.95E-01	3.05E+04	3.07E+04
8	0:11:00	**5.12E+05**	1.30E+07	**3.07E+00**	**2.68E+00**	3.94E-01	3.29E+04	3.06E+04
9	0:12:00	**4.24E+05**	1.07E+07	**3.03E+00**	**2.67E+00**	3.58E-01	2.99E+04	3.05E+04
10	0:13:00	**5.28E+05**	1.33E+07	**3.13E+00**	**2.69E+00**	4.35E-01	3.06E+04	3.04E+04
11	0:14:00	**3.86E+05**	9.72E+06	**3.03E+00**	**2.69E+00**	3.46E-01	2.81E+04	3.03E+04
12	0:19:00	**5.50E+05**	1.37E+07	**3.11E+00**	**2.70E+00**	4.14E-01	3.32E+04	2.98E+04
13	0:24:00	**4.64E+05**	1.15E+07	**3.06E+00**	**2.69E+00**	3.71E-01	3.09E+04	2.92E+04
14	0:29:00	**4.43E+05**	1.09E+07	**3.07E+00**	**2.70E+00**	3.70E-01	2.93E+04	2.87E+04
15	0:34:00	**5.00E+05**	1.21E+07	**3.14E+00**	**2.71E+00**	4.29E-01	2.83E+04	2.82E+04
16	0:49:00	**4.47E+05**	1.05E+07	**3.06E+00**	**2.69E+00**	3.71E-01	2.84E+04	2.68E+04
17	1:04:00	**4.93E+05**	1.13E+07	**3.10E+00**	**2.71E+00**	3.91E-01	2.89E+04	2.54E+04
18	1:19:00	**4.36E+05**	9.69E+06	**3.14E+00**	**2.72E+00**	4.22E-01	2.30E+04	2.41E+04
19	1:34:00	**3.70E+05**	7.99E+06	**3.07E+00**	**2.72E+00**	3.50E-01	2.28E+04	2.29E+04
20	1:49:00	**3.01E+05**	6.32E+06	**3.01E+00**	**2.70E+00**	3.07E-01	2.06E+04	2.17E+04
21	2:04:00	**4.17E+05**	8.51E+06	**3.14E+00**	**2.72E+00**	4.21E-01	2.02E+04	2.06E+04
22	2:19:00	**3.34E+05**	6.62E+06	**3.01E+00**	**2.67E+00**	3.44E-01	1.92E+04	1.95E+04
23	2:34:00	**3.16E+05**	6.09E+06	**3.00E+00**	**2.70E+00**	3.05E-01	2.00E+04	1.85E+04
24	2:49:00	**3.11E+05**	5.81E+06	**3.07E+00**	**2.71E+00**	3.53E-01	1.65E+04	1.76E+04
25	3:04:00	**3.59E+05**	6.52E+06	**3.08E+00**	**2.67E+00**	4.16E-01	1.57E+04	1.67E+04

Note: The blood specific activity (dpm/mg) is plotted against time in figure 10.

(a) 99m Tc Half-life (hrs) 6.01
Collection to Counting Time (hrs) **24.00**
Detector Efficiency (Counts/Decay) 0.62

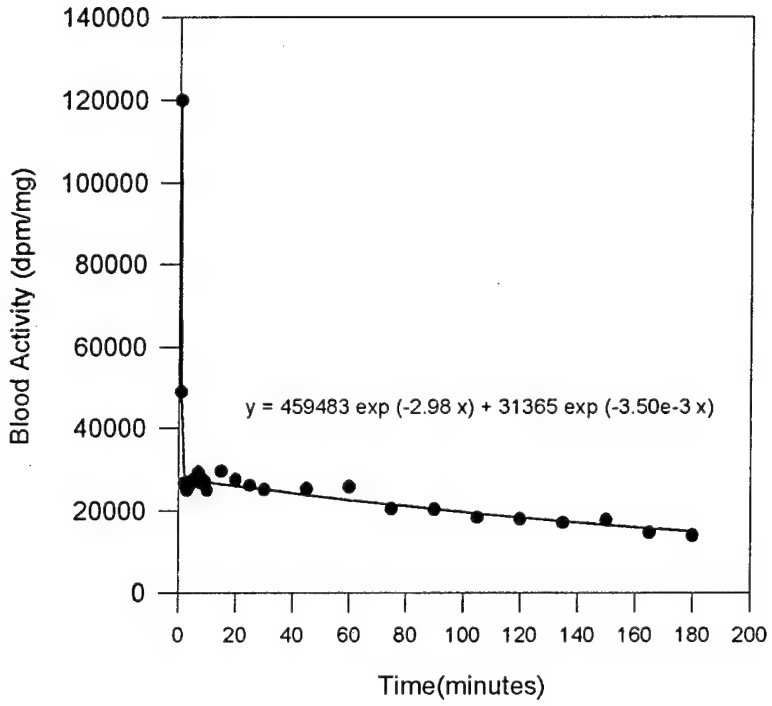

Figure 6: Blood Clearance Activity for Experiment 950726

TABLE 3

TLD DATA OF THE NORMAL REGION FOR EXPERIMENT 950726.

(This table shows the raw output of the TLDs placed on the normal myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity	
						uCi	Normalized
1	0:04:30	**5.60E+04**	2.62E+01	2.75E+01	4.42E-01	2.57E+01	1.00E+00
3	0:08:30	**5.00E+04**	2.33E+01	1.74E+01	2.81E-01	2.30E+01	8.95E-01
5	0:12:30	**4.60E+04**	2.14E+01	1.72E+01	2.77E-01	2.11E+01	8.21E-01
7	0:16:30	**3.90E+04**	1.80E+01	1.70E+01	2.73E-01	1.78E+01	6.91E-01
9	0:20:30	**4.40E+04**	2.04E+01	1.67E+01	2.69E-01	2.02E+01	7.84E-01
11	0:24:30	**3.90E+04**	1.80E+01	1.65E+01	2.65E-01	1.78E+01	6.91E-01
13	0:28:30	**3.70E+04**	1.71E+01	1.63E+01	2.62E-01	1.68E+01	6.54E-01
15	0:32:30	**3.31E+04**	1.52E+01	1.60E+01	2.58E-01	1.50E+01	5.82E-01
17	0:36:30	**3.80E+04**	1.76E+01	1.58E+01	2.55E-01	1.73E+01	6.73E-01
19	0:40:30	**3.60E+04**	1.66E+01	1.56E+01	2.51E-01	1.64E+01	6.36E-01
21	0:44:30	**3.53E+04**	1.63E+01	1.54E+01	2.48E-01	1.60E+01	6.23E-01
23	0:48:30	**3.60E+04**	1.66E+01	1.52E+01	2.44E-01	1.64E+01	6.37E-01
25	0:52:30	**3.80E+04**	1.76E+01	1.49E+01	2.41E-01	1.73E+01	6.74E-01
27	0:56:30	**3.60E+04**	1.66E+01	1.47E+01	2.37E-01	1.64E+01	6.37E-01
29	1:00:30	**3.90E+04**	1.80E+01	1.45E+01	2.34E-01	1.78E+01	6.93E-01
31	1:04:30	**4.60E+04**	2.14E+01	1.43E+01	2.31E-01	2.12E+01	8.23E-01
33	1:08:30	**4.00E+04**	1.85E+01	1.41E+01	2.28E-01	1.83E+01	7.11E-01
35	1:12:30	**4.70E+04**	2.19E+01	1.39E+01	2.24E-01	2.16E+01	8.41E-01
37	1:16:30	**3.35E+04**	1.54E+01	1.37E+01	2.21E-01	1.52E+01	5.91E-01
39	1:20:30	**3.10E+04**	1.42E+01	1.36E+01	2.18E-01	1.40E+01	5.45E-01
41	1:24:30	**2.85E+04**	1.30E+01	1.34E+01	2.15E-01	1.28E+01	4.99E-01
43	1:28:30	**3.19E+04**	1.47E+01	1.32E+01	2.12E-01	1.44E+01	5.62E-01
45	1:32:30	**3.60E+04**	1.66E+01	1.30E+01	2.09E-01	1.64E+01	6.38E-01
47	1:36:30	**3.80E+04**	1.76E+01	1.28E+01	2.06E-01	1.74E+01	6.75E-01
49	1:40:30	**3.80E+04**	1.76E+01	1.26E+01	2.03E-01	1.74E+01	6.75E-01
51	1:44:30	**3.32E+04**	1.53E+01	1.25E+01	2.01E-01	1.51E+01	5.86E-01
53	1:48:30	**3.43E+04**	1.58E+01	1.23E+01	1.98E-01	1.56E+01	6.07E-01
55	1:52:30	**3.46E+04**	1.59E+01	1.21E+01	1.95E-01	1.58E+01	6.13E-01
57	1:56:30	**3.27E+04**	1.50E+01	1.19E+01	1.92E-01	1.48E+01	5.77E-01
59	2:00:30	**3.48E+04**	1.60E+01	1.18E+01	1.90E-01	1.59E+01	6.16E-01
61	2:04:30	**3.69E+04**	1.70E+01	1.16E+01	1.87E-01	1.69E+01	6.56E-01
63	2:08:30	**3.36E+04**	1.55E+01	1.15E+01	1.84E-01	1.53E+01	5.94E-01
65	2:12:30	**3.40E+04**	1.57E+01	1.13E+01	1.82E-01	1.55E+01	6.02E-01
67	2:16:30	**3.66E+04**	1.69E+01	1.11E+01	1.79E-01	1.67E+01	6.50E-01
69	2:20:30	**3.64E+04**	1.68E+01	1.10E+01	1.77E-01	1.66E+01	6.47E-01
71	2:24:30	**4.10E+04**	1.90E+01	1.08E+01	1.74E-01	1.88E+01	7.32E-01
73	2:28:30	**3.80E+04**	1.76E+01	1.07E+01	1.72E-01	1.74E+01	6.77E-01
75	2:32:30	**3.42E+04**	1.58E+01	1.05E+01	1.70E-01	1.56E+01	6.06E-01
77	2:36:30	**3.04E+04**	1.39E+01	1.04E+01	1.67E-01	1.38E+01	5.36E-01
79	2:40:30	**3.43E+04**	1.58E+01	1.02E+01	1.65E-01	1.56E+01	6.08E-01
81	2:44:30	**3.17E+04**	1.46E+01	1.01E+01	1.63E-01	1.44E+01	5.60E-01
83	2:48:30	**3.22E+04**	1.48E+01	9.96E+00	1.60E-01	1.46E+01	5.69E-01
85	2:52:30	**3.59E+04**	1.66E+01	9.82E+00	1.58E-01	1.64E+01	6.38E-01
87	2:56:30	**3.80E+04**	1.76E+01	9.69E+00	1.56E-01	1.74E+01	6.77E-01
89	3:00:30	**3.70E+04**	1.71E+01	9.55E+00	1.54E-01	1.69E+01	6.59E-01

Note: Figure 6 shows the plot of this data.

(a) Normalization is to first datum of normal region.

TABLE 4

TLD DATA OF THE ISCHEMIC REGION FOR EXPERIMENT 950726.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a) uCi	Normalized
2	0:05:00	**3.70E+04**	1.71E+01	1.99E+01	7.83E-01	1.63E+01	6.34E-01
4	0:09:00	**3.48E+04**	1.60E+01	1.74E+01	6.86E-01	1.54E+01	5.97E-01
6	0:13:00	**3.46E+04**	1.59E+01	1.72E+01	6.77E-01	1.53E+01	5.94E-01
8	0:17:00	**4.00E+04**	1.85E+01	1.69E+01	2.73E-01	1.82E+01	7.10E-01
10	0:21:00	**5.10E+04**	2.38E+01	1.67E+01	2.69E-01	2.35E+01	9.14E-01
12	0:25:00	**4.20E+04**	1.95E+01	1.65E+01	2.65E-01	1.92E+01	7.47E-01
14	0:29:00	**4.70E+04**	2.19E+01	1.62E+01	2.61E-01	2.16E+01	8.40E-01
16	0:33:00	**4.00E+04**	1.85E+01	1.60E+01	2.58E-01	1.83E+01	7.10E-01
18	0:37:00	**4.10E+04**	1.90E+01	1.58E+01	2.54E-01	1.87E+01	7.29E-01
20	0:41:00	**4.10E+04**	1.90E+01	1.56E+01	2.51E-01	1.87E+01	7.29E-01
22	0:45:00	**4.20E+04**	1.95E+01	1.53E+01	2.47E-01	1.92E+01	7.48E-01
24	0:49:00	**4.20E+04**	1.95E+01	1.51E+01	2.44E-01	1.92E+01	7.48E-01
26	0:53:00	**4.60E+04**	2.14E+01	1.49E+01	2.40E-01	2.11E+01	8.22E-01
28	0:57:00	**4.30E+04**	2.00E+01	1.47E+01	2.37E-01	1.97E+01	7.67E-01
30	1:01:00	**4.20E+04**	1.95E+01	1.45E+01	2.34E-01	1.92E+01	7.48E-01
32	1:05:00	**4.20E+04**	1.95E+01	1.43E+01	2.30E-01	1.92E+01	7.49E-01
34	1:09:00	**4.20E+04**	1.95E+01	1.41E+01	2.27E-01	1.92E+01	7.49E-01
36	1:13:00	**6.80E+04**	3.19E+01	1.39E+01	2.24E-01	3.17E+01	1.23E+00
38	1:17:00	**4.10E+04**	1.90E+01	1.37E+01	2.21E-01	1.88E+01	7.30E-01
40	1:21:00	**4.20E+04**	1.95E+01	1.35E+01	2.18E-01	1.93E+01	7.49E-01
42	1:25:00	**4.20E+04**	1.95E+01	1.33E+01	2.15E-01	1.93E+01	7.49E-01
44	1:29:00	**4.00E+04**	1.85E+01	1.32E+01	2.12E-01	1.83E+01	7.12E-01
46	1:33:00	**4.10E+04**	1.90E+01	1.30E+01	2.09E-01	1.88E+01	7.31E-01
48	1:37:00	**4.10E+04**	1.90E+01	1.28E+01	2.06E-01	1.88E+01	7.31E-01
50	1:41:00	**4.10E+04**	1.90E+01	1.26E+01	2.03E-01	1.88E+01	7.31E-01
52	1:45:00	**4.20E+04**	1.95E+01	1.24E+01	2.00E-01	1.93E+01	7.50E-01
54	1:49:00	**3.80E+04**	1.76E+01	1.23E+01	1.97E-01	1.74E+01	6.76E-01
56	1:53:00	**4.00E+04**	1.85E+01	1.21E+01	1.95E-01	1.83E+01	7.13E-01
58	1:57:00	**4.10E+04**	1.90E+01	1.19E+01	1.92E-01	1.88E+01	7.32E-01
60	2:01:00	**4.10E+04**	1.90E+01	1.18E+01	1.89E-01	1.88E+01	7.32E-01
62	2:05:00	**4.80E+04**	2.23E+01	1.16E+01	1.87E-01	2.22E+01	8.62E-01
64	2:09:00	**4.10E+04**	1.90E+01	1.14E+01	1.84E-01	1.88E+01	7.32E-01
66	2:13:00	**3.90E+04**	1.80E+01	1.13E+01	1.82E-01	1.79E+01	6.95E-01
68	2:17:00	**4.00E+04**	1.85E+01	1.11E+01	1.79E-01	1.83E+01	7.13E-01
70	2:21:00	**3.90E+04**	1.80E+01	1.10E+01	1.77E-01	1.79E+01	6.95E-01
72	2:25:00	**4.60E+04**	2.14E+01	1.08E+01	1.74E-01	2.12E+01	8.25E-01
74	2:29:00	**4.30E+04**	2.00E+01	1.07E+01	1.72E-01	1.98E+01	7.69E-01
76	2:33:00	**4.30E+04**	2.00E+01	1.05E+01	1.69E-01	1.98E+01	7.70E-01
78	2:37:00	**4.00E+04**	1.85E+01	1.04E+01	1.67E-01	1.84E+01	7.14E-01
80	2:41:00	**4.30E+04**	2.00E+01	1.02E+01	1.65E-01	1.98E+01	7.70E-01
82	2:45:00	**3.90E+04**	1.80E+01	1.01E+01	1.62E-01	1.79E+01	6.96E-01
84	2:49:00	**4.10E+04**	1.90E+01	9.94E+00	1.60E-01	1.88E+01	7.33E-01
86	2:53:00	**3.60E+04**	1.66E+01	9.80E+00	1.58E-01	1.65E+01	6.40E-01
88	2:57:00	**3.50E+04**	1.61E+01	9.67E+00	1.56E-01	1.60E+01	6.22E-01
90	3:01:00	**4.10E+04**	1.90E+01	9.53E+00	1.53E-01	1.88E+01	7.33E-01

Note: Figure 6 shows the plot of this data.

(a) Normalization is to first datum of normal region (Table 3).

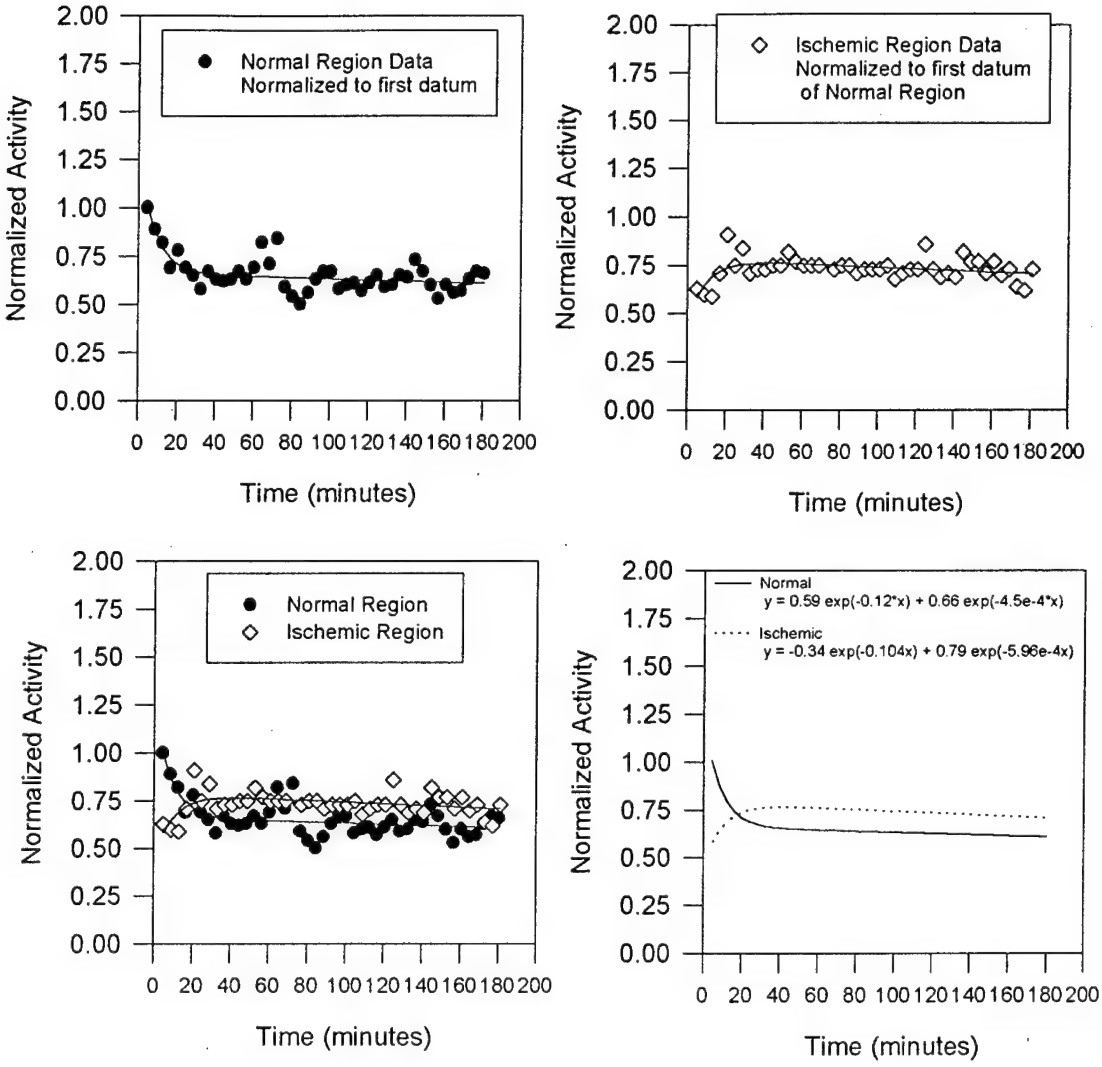

Figure 7: Above graphs are for experiment 950726. a. Normal Region Activity Clearance. b. Plot of Ischemic Region Clearance, c. Combine plot of Normal and Ishcemic d. Fit to the clearance of normal and ischemic region

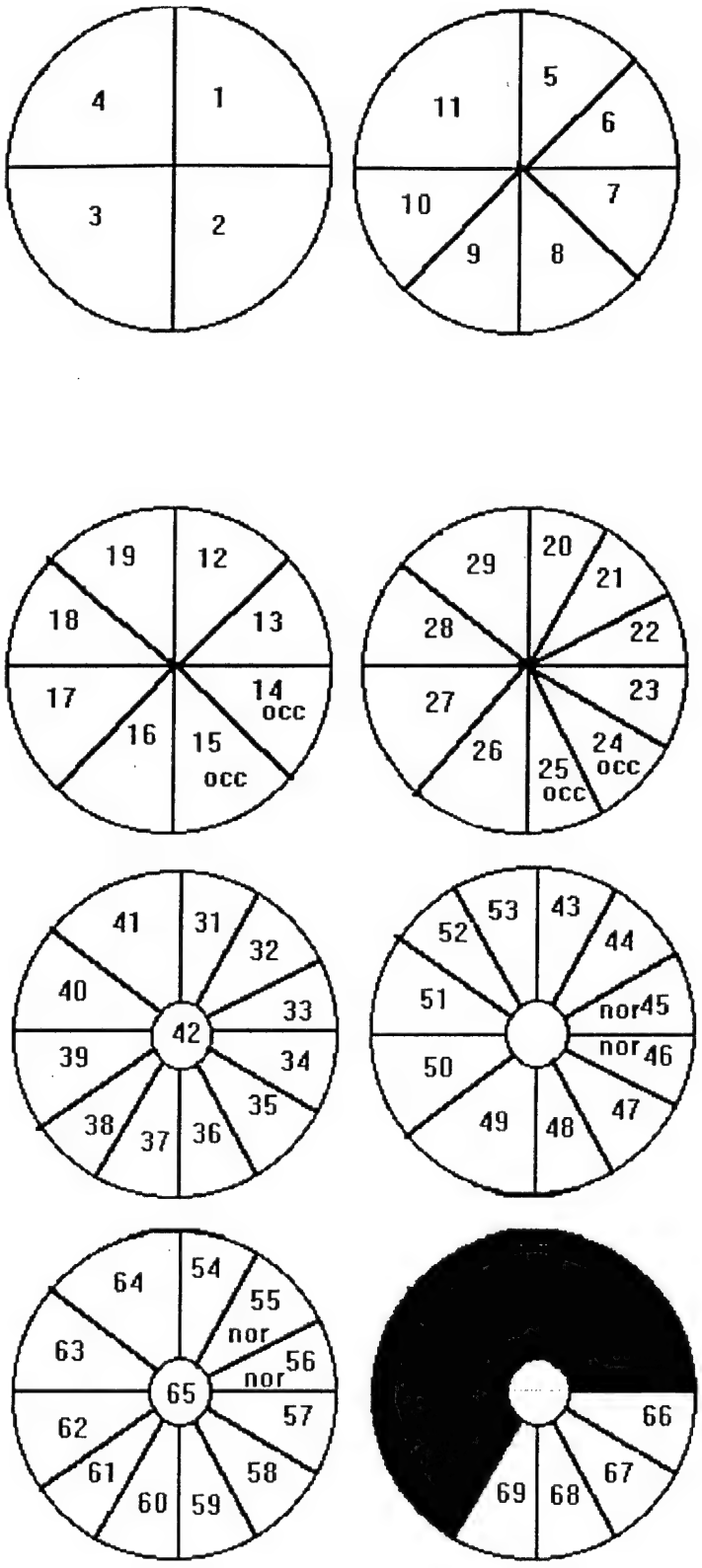

Figure 8: Dissection of the heart for experiment 950726. TLD placement for normal region is marked with 'norm' and TLD placement for ischemic (occluded) region is marked with 'occ'.

TABLE 5

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950726

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
1	2.9E-02	7.08E+04	5.50E+02	2.46E+02	8.16E+02	2.17E+04	0.0	1.9	0.0	1.49E+05	8.87E+02	3.99E+02	1.32E+03
2	3.6E-02	1.07E+05	7.15E+02	3.74E+01	1.50E+03	3.67E+04	0.0	5.9	0.0	2.32E+05	1.15E+03	6.98E+01	2.43E+03
3	3.4E-02	9.26E+04	7.25E+02	4.16E+02	1.62E+03	2.02E+04	0.0	3.0	0.0	1.82E+05	1.17E+03	6.76E+02	2.61E+03
4	4.8E-02	1.34E+05	1.08E+03	1.48E+03	2.33E+03	2.42E+04	0.0	6.9	0.0	2.55E+05	1.73E+03	2.40E+03	3.76E+03
5	3.6E-02	7.85E+04	1.08E+03	1.44E+03	1.63E+03	2.09E+04	0.0	4.8	3.0	1.60E+05	1.74E+03	2.34E+03	2.63E+03
6	2.8E-02	9.91E+04	8.43E+02	3.64E+01	1.58E+03	2.85E+04	0.0	0.0	0.1	2.06E+05	1.36E+03	5.87E+01	2.54E+03
7	4.1E-02	9.37E+04	7.39E+02	2.92E+01	1.38E+03	2.79E+04	0.0	0.8	3.1	1.96E+05	1.19E+03	4.84E+01	2.24E+03
8	3.2E-02	8.73E+04	6.17E+02	2.91E+01	1.55E+03	2.69E+04	0.0	0.0	2.1	1.84E+05	9.95E+02	4.69E+01	2.50E+03
9	1.6E-02	5.54E+04	5.44E+02	2.19E+01	1.15E+03	1.65E+04	0.0	1.8	3.0	1.16E+05	8.78E+02	3.82E+01	1.86E+03
10	3.2E-02	3.82E+04	7.66E+02	1.18E+03	1.20E+03	9.67E+03	0.0	1.0	0.0	7.72E+04	1.23E+03	1.91E+03	1.94E+03
11	3.2E-02	6.17E+04	1.08E+03	2.24E+03	1.86E+03	1.53E+04	0.0	4.0	0.0	1.24E+05	1.74E+03	3.62E+03	3.00E+03
12	2.8E-02	5.92E+04	8.82E+02	1.91E+03	1.37E+03	1.50E+04	0.0	4.9	2.0	1.20E+05	1.42E+03	3.09E+03	2.22E+03
13	2.7E-02	6.41E+04	9.62E+02	5.21E+01	1.51E+03	1.52E+04	0.0	2.5	8.0	1.28E+05	1.55E+03	8.81E+01	2.45E+03
14	2.3E-02	7.54E+04	5.82E+02	3.34E+01	1.35E+03	1.74E+04	0.0	1.0	0.0	1.50E+05	9.38E+02	5.55E+01	2.18E+03
15	2.1E-02	4.82E+04	5.89E+02	2.67E+01	8.67E+02	1.45E+04	0.0	2.0	0.0	1.01E+05	9.50E+02	4.63E+01	1.40E+03
16	3.5E-02	8.05E+04	8.35E+02	9.05E+02	1.64E+03	1.92E+04	0.0	8.0	0.0	1.61E+05	1.35E+03	1.47E+03	2.64E+03
17	1.5E-02	4.97E+04	8.24E+02	1.96E+03	1.19E+03	1.05E+04	0.0	5.0	0.0	9.71E+04	1.33E+03	3.16E+03	1.91E+03
18	2.1E-02	4.16E+04	7.03E+02	1.86E+03	1.18E+03	1.03E+04	0.0	5.0	0.0	8.37E+04	1.13E+03	3.01E+03	1.91E+03
19	1.6E-02	3.92E+04	8.25E+02	1.94E+03	1.35E+03	1.07E+04	0.0	6.8	3.0	8.06E+04	1.33E+03	3.14E+03	2.18E+03
20	2.6E-02	7.96E+04	1.25E+03	2.69E+03	1.99E+03	1.45E+04	0.0	9.0	0.0	1.52E+05	2.02E+03	4.35E+03	3.22E+03
21	3.6E-02	5.87E+04	1.12E+03	7.31E+02	1.63E+03	1.40E+04	0.0	0.0	2.0	1.17E+05	1.80E+03	1.18E+03	2.63E+03
22	3.1E-02	6.53E+04	1.08E+03	9.30E+00	1.47E+03	1.78E+04	0.0	3.1	16.1	1.34E+05	1.74E+03	2.00E+01	2.40E+03
23	3.2E-02	9.26E+04	9.31E+02	4.65E+01	1.68E+03	2.65E+04	0.0	0.0	2.1	1.92E+05	1.50E+03	7.50E+01	2.72E+03
24	3.1E-02	7.21E+04	8.33E+02	1.77E+01	1.43E+03	1.95E+04	0.0	6.7	5.0	1.48E+05	1.34E+03	3.94E+01	2.32E+03
25	2.4E-02	4.78E+04	8.47E+02	7.18E+02	1.22E+03	1.42E+04	0.0	1.0	0.0	9.99E+04	1.37E+03	1.16E+03	1.97E+03
26	2.4E-02	7.43E+04	6.44E+02	1.98E+03	1.01E+03	1.56E+04	0.0	11.7	6.0	1.45E+05	1.04E+03	3.21E+03	1.64E+03
27	4.2E-02	6.95E+04	9.30E+02	2.82E+03	1.54E+03	1.30E+04	0.0	9.0	0.0	1.33E+05	1.50E+03	4.57E+03	2.48E+03
28	2.9E-02	8.48E+04	1.26E+03	3.38E+03	2.04E+03	1.09E+04	0.0	6.0	0.0	1.54E+05	2.03E+03	5.47E+03	3.29E+03
29	1.9E-02	6.66E+04	1.42E+03	2.99E+03	1.91E+03	1.36E+04	0.0	8.6	7.0	1.29E+05	2.29E+03	4.84E+03	3.10E+03
30	3.0E-02	5.39E+04	8.44E+02	5.02E+01	1.76E+03	8.37E+03	0.0	3.0	0.0	1.00E+05	1.36E+03	8.58E+01	2.84E+03
31	4.0E-02	9.32E+04	9.61E+02	2.42E+03	1.59E+03	1.82E+04	0.0	11.0	0.0	1.80E+05	1.55E+03	3.92E+03	2.57E+03
32	2.9E-02	6.86E+04	1.61E+03	2.82E+03	2.22E+03	1.41E+04	0.0	1.0	0.0	1.33E+05	2.60E+03	4.55E+03	3.58E+03
33	3.4E-02	1.14E+05	1.13E+03	2.71E+02	1.55E+03	2.45E+04	0.0	1.9	0.0	2.24E+05	1.82E+03	4.40E+02	2.50E+03
34	3.7E-02	9.65E+04	1.17E+03	2.85E+02	2.04E+03	2.31E+04	0.0	3.0	0.0	1.93E+05	1.89E+03	4.64E+02	3.29E+03
35	2.7E-02	6.49E+04	1.01E+03	3.33E+02	1.65E+03	1.29E+04	0.0	3.0	0.0	1.25E+05	1.63E+03	5.42E+02	2.66E+03
36	2.6E-02	5.15E+04	8.53E+02	2.06E+03	1.47E+03	1.24E+04	0.0	4.0	0.0	1.03E+05	1.38E+03	3.33E+03	2.37E+03

TABLE 5- CONTINUED

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950726

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath Activity in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
37	3.6E-02	9.00E+04	8.65E+02	2.98E+03	1.68E+03	1.78E+04	0.0	7.8	3.0	1.74E+05	1.40E+03	4.82E+03	2.72E+03
38	2.2E-02	6.12E+04	8.96E+02	2.37E+03	1.37E+03	1.14E+04	0.0	12.0	0.0	1.17E+05	1.45E+03	3.84E+03	2.22E+03
39	3.4E-02	5.09E+04	9.23E+02	2.13E+03	1.18E+03	9.56E+03	0.0	7.8	3.0	9.75E+04	1.49E+03	3.45E+03	1.90E+03
40	3.3E-02	6.92E+04	1.37E+03	2.89E+03	1.61E+03	1.51E+04	0.0	3.9	1.0	1.36E+05	2.20E+03	4.67E+03	2.60E+03
41	3.9E-02	8.15E+04	1.18E+03	2.44E+03	1.70E+03	1.43E+04	0.0	10.9	2.0	1.55E+05	1.91E+03	3.95E+03	2.74E+03
42	2.4E-02	5.03E+04	7.90E+02	3.57E+01	1.31E+03	1.13E+04	0.0	0.0	5.0	9.94E+04	1.27E+03	5.76E+01	2.13E+03
43	5.4E-02	1.44E+05	1.58E+03	3.51E+03	2.31E+03	2.54E+04	0.0	9.8	3.0	2.73E+05	2.55E+03	5.67E+03	3.73E+03
44	4.0E-02	7.21E+04	1.29E+03	2.90E+03	1.79E+03	1.83E+04	0.0	10.7	5.0	1.46E+05	2.08E+03	4.70E+03	2.89E+03
45	3.7E-02	8.56E+04	1.59E+03	2.89E+03	2.09E+03	2.02E+04	0.0	0.0	0.0	1.71E+05	2.56E+03	4.67E+03	3.38E+03
46	4.3E-02	8.25E+04	1.06E+03	1.17E+03	1.56E+03	2.25E+04	0.0	4.7	5.0	1.69E+05	1.71E+03	1.89E+03	2.52E+03
47	3.8E-02	7.50E+04	1.36E+03	3.06E+03	2.07E+03	2.05E+04	0.0	4.6	7.0	1.54E+05	2.19E+03	4.94E+03	3.34E+03
48	3.6E-02	7.31E+04	1.02E+03	3.39E+03	1.74E+03	1.87E+04	0.0	1.7	5.0	1.48E+05	1.64E+03	5.47E+03	2.82E+03
49	4.0E-02	9.69E+04	8.66E+02	3.20E+03	1.82E+03	2.33E+04	0.0	13.7	5.0	1.94E+05	1.40E+03	5.18E+03	2.94E+03
50	3.5E-02	5.72E+04	8.75E+02	2.43E+03	1.42E+03	1.32E+04	0.0	12.0	0.0	1.14E+05	1.41E+03	3.93E+03	2.29E+03
51	3.0E-02	5.66E+04	1.01E+03	5.47E+03	1.82E+03	1.31E+04	0.0	7.0	0.0	1.13E+05	1.62E+03	8.83E+03	2.93E+03
52	4.2E-02	7.08E+04	1.21E+03	2.40E+03	1.68E+03	1.56E+04	0.0	14.0	0.0	1.39E+05	1.95E+03	3.89E+03	2.72E+03
53	1.2E-02	6.01E+04	3.40E+02	1.12E+03	8.09E+02	1.35E+04	0.0	3.0	0.0	1.19E+05	5.48E+02	1.82E+03	1.30E+03
54	1.1E-02	9.32E+04	6.51E+02	1.88E+03	1.14E+03	1.56E+04	0.0	7.7	6.0	1.76E+05	1.05E+03	3.04E+03	1.85E+03
55	2.3E-02	7.62E+04	8.68E+02	2.47E+03	1.63E+03	1.52E+04	0.0	3.7	5.0	1.47E+05	1.40E+03	3.99E+03	2.63E+03
56	4.4E-02	1.08E+05	1.42E+03	3.63E+03	2.26E+03	2.22E+04	0.0	7.7	5.0	2.10E+05	2.29E+03	5.87E+03	3.66E+03
57	2.7E-02	7.47E+04	1.34E+03	3.03E+03	1.88E+03	1.60E+04	0.0	7.0	0.0	1.46E+05	2.16E+03	4.90E+03	3.03E+03
58	3.3E-02	9.32E+04	1.26E+03	3.73E+03	2.11E+03	1.95E+04	0.0	4.0	0.0	1.82E+05	2.04E+03	6.02E+03	3.40E+03
59	3.2E-02	7.84E+04	1.11E+03	3.82E+03	2.15E+03	1.93E+04	0.0	11.9	2.0	1.58E+05	1.79E+03	6.18E+03	3.47E+03
60	4.1E-02	1.21E+05	1.71E+03	4.97E+03	3.24E+03	2.46E+04	0.0	13.7	6.0	2.35E+05	2.76E+03	8.03E+03	5.24E+03
61	2.3E-02	6.49E+04	6.60E+02	2.67E+03	1.70E+03	1.42E+04	0.0	19.0	0.0	1.28E+05	1.06E+03	4.34E+03	2.75E+03
62	3.0E-02	7.93E+04	9.88E+02	9.63E+03	1.74E+03	1.74E+04	0.0	32.0	1.9	1.56E+05	1.59E+03	1.56E+04	2.80E+03
63	2.6E-02	1.07E+05	9.91E+02	3.24E+03	1.88E+03	1.97E+04	0.0	17.0	0.0	2.05E+05	1.60E+03	5.25E+03	3.04E+03
64	2.1E-02	6.01E+04	7.68E+02	1.87E+03	1.06E+03	1.05E+04	0.0	11.0	0.0	1.14E+05	1.24E+03	3.04E+03	1.71E+03
65	7.0E-03	2.60E+04	5.29E+02	1.33E+03	8.29E+02	7.07E+03	0.0	2.7	5.0	5.33E+04	8.53E+02	2.14E+03	1.35E+03
66	2.4E-02	1.35E+05	9.95E+02	3.50E+03	1.56E+03	3.07E+04	0.0	16.8	3.0	2.67E+05	1.61E+03	5.68E+03	2.51E+03
67	3.6E-02	1.05E+05	1.39E+03	3.97E+03	2.09E+03	2.37E+04	0.0	12.0	0.0	2.07E+05	2.23E+03	6.42E+03	3.37E+03
68	4.9E-02	2.49E+05	1.02E+03	4.40E+03	2.12E+03	3.29E+04	0.0	16.9	2.0	4.55E+05	1.64E+03	7.12E+03	3.42E+03
69	4.8E-02	1.96E+05	1.14E+03	5.26E+03	2.91E+03	3.86E+04	0.0	3.8	2.0	3.78E+05	1.84E+03	8.49E+03	4.70E+03
Totals	2.14E+00									1.10E+07	1.09E+05	2.32E+05	1.83E+05

TABLE 6

REFERENCE BLOOD ACTIVITY

(Experiment 950726)

Microsphere Blood Counts(cpm)		
Cr-51	Ru-103	Nb-95
2.17E+03	5.43E+03	3.30E+03
2.17E+03	5.92E+03	3.41E+03
2.22E+03	5.76E+03	3.36E+03
2.15E+03	5.76E+03	3.60E+03
2.18E+03	5.57E+03	3.54E+03
2.15E+03	5.80E+03	3.45E+03
2.21E+03	5.68E+03	3.47E+03
2.22E+03	4.54E+03	3.40E+03
2.15E+03	5.61E+03	3.31E+03
2.20E+03	5.50E+03	3.43E+03
2.12E+03	5.27E+03	3.61E+03
2.24E+03	5.43E+03	3.48E+03
2.22E+03	5.34E+03	3.38E+03
2.14E+03	4.82E+03	2.64E+03
2.14E+03	5.97E+03	3.06E+03
1.87E+03	7.17E+03	1.15E+04
3.26E+03	2.30E+02	3.34E+02
1.67E+02		
Totals (cpm): 3.80E+04	8.98E+04	6.23E+04
Activity(dpm): 6.13E+04	1.45E+05	1.00E+05
Volumes(ml): 6.00E+00	5.70E+00	6.50E+00

TABLE 7

ABSOLUTE FLOWS AND TC-99m DISTRIBUTION IN MYOCARDIUM

(Experiment 950726)

Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95	Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95
1	1.00E+00	9.98E-01	1.80E-01	9.79E-01	36	7.70E-01	1.73E+00	1.68E+00	1.97E+00
2	1.25E+00	1.05E+00	2.54E-02	1.45E+00	37	9.38E-01	1.27E+00	1.76E+00	1.63E+00
3	1.04E+00	1.12E+00	2.61E-01	1.66E+00	38	1.03E+00	2.14E+00	2.29E+00	2.17E+00
4	1.03E+00	1.18E+00	6.56E-01	1.69E+00	39	5.57E-01	1.43E+00	1.33E+00	1.21E+00
5	8.65E-01	1.58E+00	8.51E-01	1.58E+00	40	8.01E-01	2.18E+00	1.85E+00	1.70E+00
6	1.43E+00	1.59E+00	2.75E-02	1.96E+00	41	7.70E-01	1.60E+00	1.33E+00	1.52E+00
7	9.29E-01	9.49E-01	1.55E-02	1.18E+00	42	8.04E-01	1.73E+00	3.15E-02	1.91E+00
8	1.12E+00	1.02E+00	1.92E-02	1.69E+00	43	9.81E-01	1.54E+00	1.38E+00	1.49E+00
9	1.41E+00	1.79E+00	3.13E-02	2.50E+00	44	7.08E-01	1.70E+00	1.54E+00	1.56E+00
10	4.69E-01	1.26E+00	7.83E-01	1.31E+00	45	8.96E-01	2.26E+00	1.65E+00	1.97E+00
11	7.53E-01	1.78E+00	1.48E+00	2.03E+00	46	7.65E-01	1.29E+00	5.77E-01	1.26E+00
12	8.30E-01	1.66E+00	1.45E+00	1.71E+00	47	7.87E-01	1.88E+00	1.70E+00	1.90E+00
13	9.20E-01	1.88E+00	4.28E-02	1.96E+00	48	7.99E-01	1.49E+00	1.99E+00	1.69E+00
14	1.26E+00	1.33E+00	3.16E-02	2.04E+00	49	9.42E-01	1.14E+00	1.70E+00	1.59E+00
15	9.36E-01	1.48E+00	2.89E-02	1.44E+00	50	6.31E-01	1.32E+00	1.47E+00	1.41E+00
16	8.92E-01	1.26E+00	5.52E-01	1.63E+00	51	7.29E-01	1.77E+00	3.86E+00	2.11E+00
17	1.26E+00	2.89E+00	2.77E+00	2.75E+00	52	6.44E-01	1.52E+00	1.21E+00	1.39E+00
18	7.75E-01	1.76E+00	1.88E+00	1.96E+00	53	1.92E+00	1.49E+00	1.99E+00	2.34E+00
19	9.78E-01	2.71E+00	2.57E+00	2.94E+00	54	3.10E+00	3.11E+00	3.62E+00	3.64E+00
20	1.13E+00	2.54E+00	2.20E+00	2.67E+00	55	1.25E+00	1.99E+00	2.28E+00	2.47E+00
21	6.33E-01	1.63E+00	4.30E-01	1.57E+00	56	9.29E-01	1.70E+00	1.75E+00	1.79E+00
22	8.40E-01	1.84E+00	8.46E-03	1.67E+00	57	1.05E+00	2.61E+00	2.38E+00	2.42E+00
23	1.17E+00	1.53E+00	3.07E-02	1.83E+00	58	1.07E+00	2.02E+00	2.39E+00	2.22E+00
24	9.26E-01	1.41E+00	1.67E-02	1.61E+00	59	9.57E-01	1.82E+00	2.53E+00	2.34E+00
25	8.08E-01	1.86E+00	6.33E-01	1.77E+00	60	1.12E+00	2.20E+00	2.57E+00	2.76E+00
26	1.17E+00	1.41E+00	1.76E+00	1.47E+00	61	1.08E+00	1.51E+00	2.47E+00	2.58E+00
27	6.16E-01	1.17E+00	1.43E+00	1.27E+00	62	1.01E+00	1.73E+00	6.81E+00	2.02E+00
28	1.03E+00	2.28E+00	2.47E+00	2.45E+00	63	1.53E+00	2.01E+00	2.65E+00	2.52E+00
29	1.32E+00	3.94E+00	3.34E+00	3.52E+00	64	1.05E+00	1.93E+00	1.90E+00	1.76E+00
30	6.51E-01	1.48E+00	3.75E-02	2.04E+00	65	1.48E+00	3.98E+00	4.01E+00	4.15E+00
31	8.73E-01	1.27E+00	1.29E+00	1.39E+00	66	2.16E+00	2.18E+00	3.10E+00	2.26E+00
32	8.93E-01	2.92E+00	2.06E+00	2.67E+00	67	1.12E+00	2.03E+00	2.34E+00	2.02E+00
33	1.28E+00	1.75E+00	1.70E-01	1.58E+00	68	1.80E+00	1.10E+00	1.91E+00	1.51E+00
34	1.01E+00	1.67E+00	1.64E-01	1.92E+00	69	1.53E+00	1.25E+00	2.32E+00	2.11E+00
35	9.02E-01	1.98E+00	2.63E-01	2.12E+00					

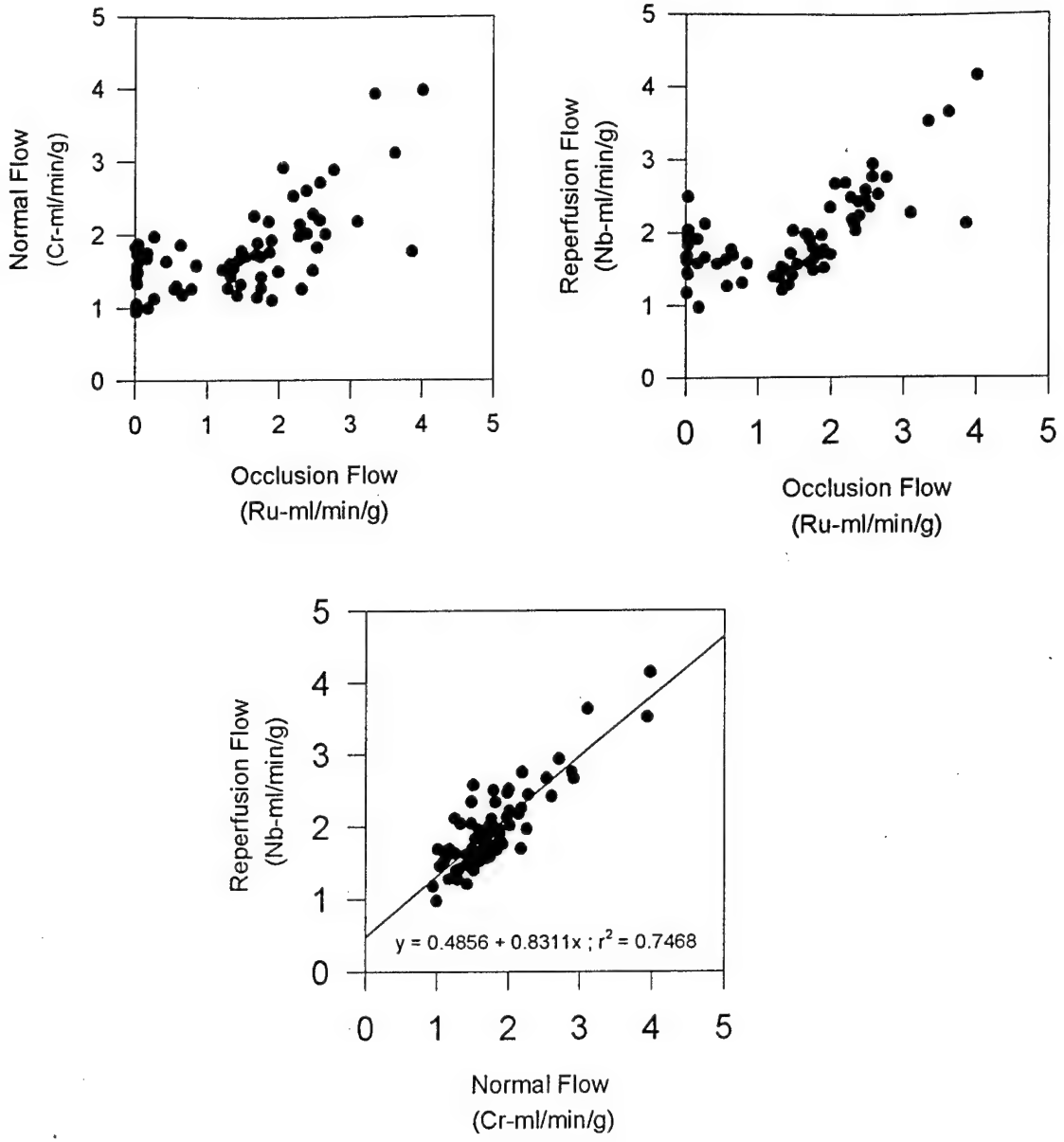

Figure 9: Above graphs are the reference blood comparisons flows for Experiment 950726. a. Plot of normal reference blood flow vs occlusion flow, b. Plot of reperfusion flow vs occlusion flow, c. Plot of reperfusion flow vs normal flow.

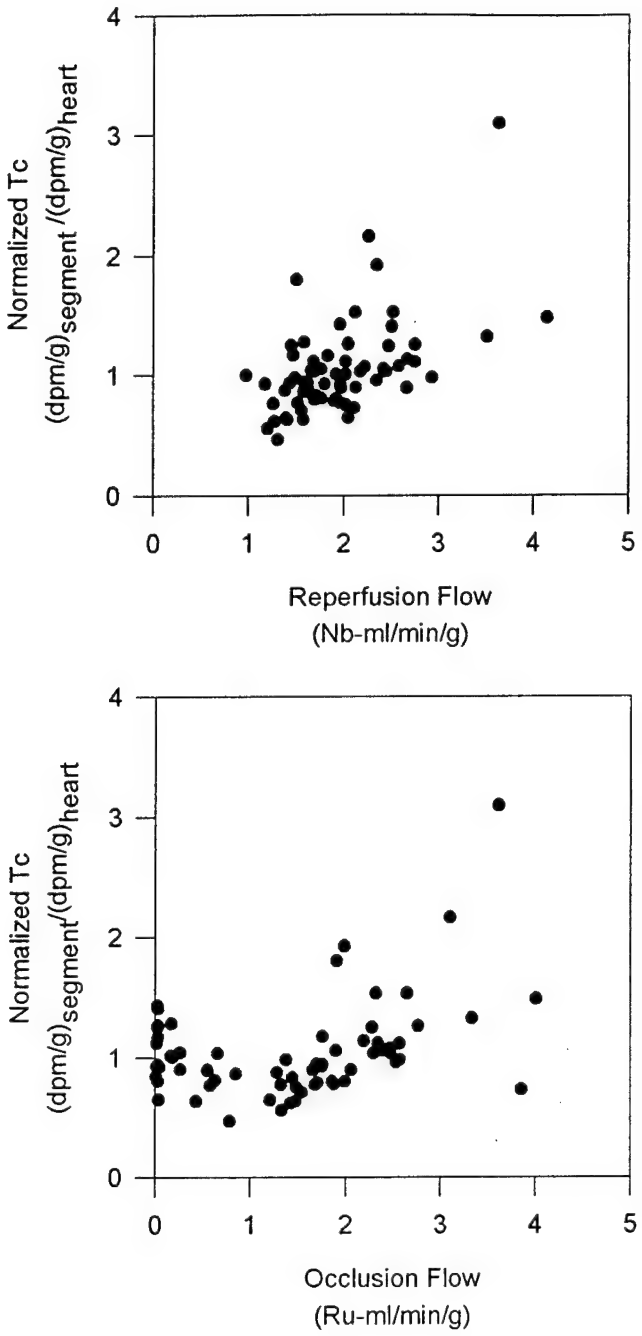

Figure 10: Above graphs are comparisons of Tc-99m distribution in each heart segment to the reference blood flows in the segment for Experiment 950726. a. Plot of normalized Tc vs reperfusion flow b. Plot of normalized Tc vs occlusion flow

Appendix 2

Data Tables and Illustrations for Experiment 950728

TABLE 8

BLOOD CLEARANCE FOR EXPERIMENT 950728.

Sample #	Lapse Time HH:MM:SS	Measurement CPM	Corrected DPM	Tube-Blood Mass in g	Tube Mass g	Blood Mass g	Calculated dpm/mg	Fit Data dpm/mg
1	0:04:30	1.07E+06	8.42E+07	3.01E+00	2.68E+00	3.38E-01	2.49E+05	2.49E+05
2	0:05:00	3.06E+05	2.41E+07	3.14E+00	2.70E+00	4.31E-01	5.59E+04	5.59E+04
3	0:06:00	1.68E+05	1.32E+07	3.07E+00	2.69E+00	3.78E-01	3.48E+04	3.31E+04
4	0:07:00	1.87E+05	1.47E+07	3.11E+00	2.70E+00	4.16E-01	3.53E+04	3.26E+04
5	0:08:00	1.61E+05	1.26E+07	3.04E+00	2.67E+00	3.65E-01	3.44E+04	3.23E+04
6	0:09:00	1.68E+05	1.31E+07	3.09E+00	2.68E+00	4.13E-01	3.17E+04	3.20E+04
7	0:10:00	1.52E+05	1.18E+07	3.09E+00	2.69E+00	3.99E-01	2.96E+04	3.17E+04
8	0:11:00	1.58E+05	1.23E+07	3.08E+00	2.72E+00	3.65E-01	3.37E+04	3.14E+04
9	0:12:00	1.67E+05	1.30E+07	3.08E+00	2.67E+00	4.06E-01	3.19E+04	3.12E+04
10	0:13:00	1.77E+05	1.37E+07	3.14E+00	2.69E+00	4.50E-01	3.04E+04	3.09E+04
11	0:14:00	1.74E+05	1.34E+07	3.12E+00	2.68E+00	4.42E-01	3.04E+04	3.06E+04
12	0:19:00	1.55E+05	1.19E+07	3.12E+00	2.72E+00	4.01E-01	2.96E+04	2.93E+04
13	0:24:00	1.44E+05	1.09E+07	3.10E+00	2.69E+00	4.07E-01	2.67E+04	2.81E+04
14	0:29:00	1.05E+05	7.86E+06	3.07E+00	2.73E+00	3.47E-01	2.26E+04	2.69E+04
15	0:34:00	1.28E+05	9.48E+06	3.09E+00	2.69E+00	4.01E-01	2.36E+04	2.57E+04
16	0:49:00	1.11E+05	8.01E+06	3.07E+00	2.68E+00	3.86E-01	2.07E+04	2.26E+04
17	1:04:00	1.08E+05	7.55E+06	3.12E+00	2.72E+00	4.04E-01	1.87E+04	1.98E+04
18	1:19:00	1.07E+05	7.28E+06	3.10E+00	2.68E+00	4.15E-01	1.75E+04	1.74E+04
19	1:34:00	8.86E+04	5.87E+06	3.10E+00	2.71E+00	3.87E-01	1.52E+04	1.52E+04
20	1:49:00	8.87E+04	5.71E+06	3.18E+00	2.75E+00	4.29E-01	1.33E+04	1.34E+04
21	2:04:00	8.03E+04	5.02E+06	3.14E+00	2.76E+00	3.77E-01	1.33E+04	1.17E+04
22	2:19:00	6.98E+04	4.24E+06	3.10E+00	2.69E+00	4.02E-01	1.06E+04	1.03E+04
23	2:34:00	6.81E+04	4.02E+06	3.12E+00	2.72E+00	4.03E-01	9.98E+03	9.02E+03
24	2:49:00	5.49E+04	3.15E+06	3.04E+00	2.71E+00	3.36E-01	9.38E+03	7.91E+03
25	3:04:00	6.53E+04	3.64E+06	3.14E+00	2.70E+00	4.41E-01	8.26E+03	6.94E+03

Note: The blood specific activity (dpm/mg) is plotted against time in figure 10.

(a) 99m Tc Half-life (hrs) 6.01
Collection to Counting Time (hrs) **33.72**
Detector Efficiency (Counts/Decay) 0.62

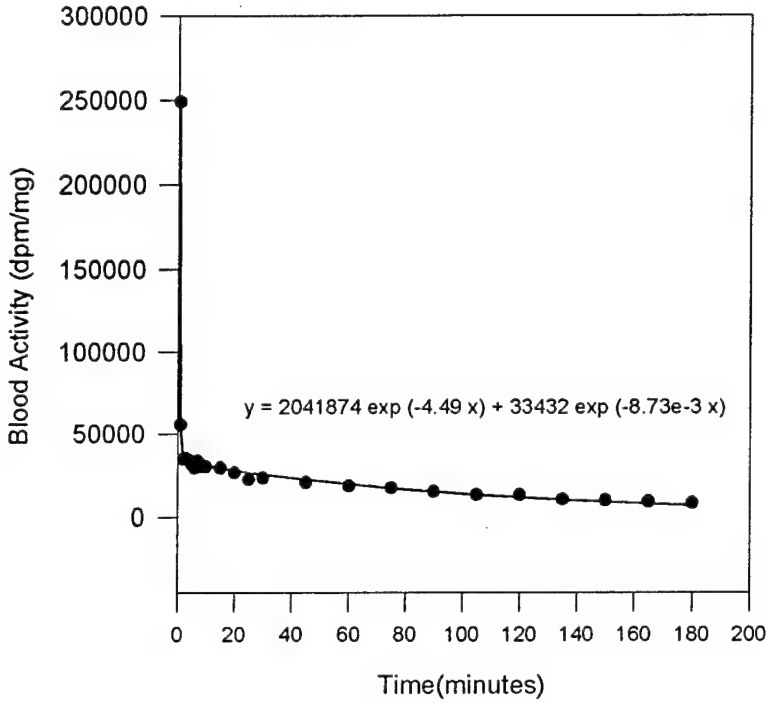

Figure 11: Blood Clearance Activity for Experiment 950728.

TABLE 9

TLD DATA OF THE NORMAL REGION FOR EXPERIMENT 950728.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a) uCi	Normalized
1	0:04:30	**5.10E+04**	2.38E+01	3.23E+01	5.20E-01	2.32E+01	1.00E+00
3	0:08:30	**3.90E+04**	1.80E+01	1.81E+01	2.91E-01	1.78E+01	7.64E-01
5	0:12:30	**3.80E+04**	1.76E+01	1.74E+01	2.81E-01	1.73E+01	7.44E-01
7	0:16:30	**3.60E+04**	1.66E+01	1.68E+01	2.71E-01	1.63E+01	7.03E-01
9	0:20:30	**3.53E+04**	1.63E+01	1.63E+01	2.62E-01	1.60E+01	6.89E-01
11	0:24:30	**3.39E+04**	1.56E+01	1.57E+01	2.53E-01	1.54E+01	6.61E-01
13	0:28:30	**3.61E+04**	1.67E+01	1.52E+01	2.44E-01	1.64E+01	7.06E-01
15	0:32:30	**3.80E+04**	1.76E+01	1.46E+01	2.36E-01	1.73E+01	7.45E-01
17	0:36:30	**3.80E+04**	1.76E+01	1.41E+01	2.28E-01	1.73E+01	7.46E-01
19	0:40:30	**3.80E+04**	1.76E+01	1.37E+01	2.20E-01	1.73E+01	7.46E-01
21	0:44:30	**4.10E+04**	1.90E+01	1.32E+01	2.12E-01	1.88E+01	8.08E-01
23	0:48:30	**3.90E+04**	1.80E+01	1.27E+01	2.05E-01	1.78E+01	7.67E-01
25	0:52:30	**3.80E+04**	1.76E+01	1.23E+01	1.98E-01	1.74E+01	7.47E-01
27	0:56:30	**3.45E+04**	1.59E+01	1.19E+01	1.91E-01	1.57E+01	6.76E-01
29	1:00:30	**3.60E+04**	1.66E+01	1.15E+01	1.85E-01	1.64E+01	7.07E-01
31	1:04:30	**3.80E+04**	1.76E+01	1.11E+01	1.78E-01	1.74E+01	7.48E-01
33	1:08:30	**3.90E+04**	1.80E+01	1.07E+01	1.72E-01	1.79E+01	7.69E-01
35	1:12:30	**4.00E+04**	1.85E+01	1.03E+01	1.66E-01	1.84E+01	7.89E-01
37	1:16:30	**3.60E+04**	1.66E+01	9.97E+00	1.61E-01	1.65E+01	7.08E-01
39	1:20:30	**3.52E+04**	1.62E+01	9.63E+00	1.55E-01	1.61E+01	6.91E-01
41	1:24:30	**3.70E+04**	1.71E+01	9.30E+00	1.50E-01	1.69E+01	7.29E-01
43	1:28:30	**4.00E+04**	1.85E+01	8.98E+00	1.45E-01	1.84E+01	7.90E-01
45	1:32:30	**3.63E+04**	1.68E+01	8.67E+00	1.40E-01	1.66E+01	7.15E-01
47	1:36:30	**3.70E+04**	1.71E+01	8.37E+00	1.35E-01	1.70E+01	7.29E-01
49	1:40:30	**3.80E+04**	1.76E+01	8.09E+00	1.30E-01	1.74E+01	7.50E-01
51	1:44:30	**3.90E+04**	1.80E+01	7.81E+00	1.26E-01	1.79E+01	7.71E-01
53	1:48:30	**3.60E+04**	1.66E+01	7.54E+00	1.21E-01	1.65E+01	7.09E-01
55	1:52:30	**3.80E+04**	1.76E+01	7.28E+00	1.17E-01	1.75E+01	7.51E-01
57	1:56:30	**3.80E+04**	1.76E+01	7.03E+00	1.13E-01	1.75E+01	7.51E-01
59	2:00:30	**3.47E+04**	1.60E+01	6.79E+00	1.09E-01	1.59E+01	6.83E-01
61	2:04:30	**3.56E+04**	1.64E+01	6.56E+00	1.06E-01	1.63E+01	7.02E-01
63	2:08:30	**3.60E+04**	1.66E+01	6.33E+00	1.02E-01	1.65E+01	7.10E-01
65	2:12:30	**3.62E+04**	1.67E+01	6.11E+00	9.84E-02	1.66E+01	7.14E-01
67	2:16:30	**3.57E+03**	1.14E+00	5.90E+00	9.50E-02	1.05E+00	4.50E-02
69	2:20:30	**3.70E+04**	1.71E+01	5.70E+00	9.18E-02	1.70E+01	7.31E-01
71	2:24:30	**3.15E+04**	1.45E+01	5.51E+00	8.86E-02	1.44E+01	6.18E-01
73	2:28:30	**3.80E+04**	1.76E+01	5.32E+00	8.56E-02	1.75E+01	7.52E-01
75	2:32:30	**3.30E+04**	1.52E+01	5.13E+00	8.27E-02	1.51E+01	6.49E-01
77	2:36:30	**3.61E+04**	1.67E+01	4.96E+00	7.98E-02	1.66E+01	7.13E-01
79	2:40:30	**3.66E+04**	1.69E+01	4.79E+00	7.71E-02	1.68E+01	7.24E-01
81	2:44:30	**3.60E+04**	1.66E+01	4.62E+00	7.44E-02	1.65E+01	7.11E-01
83	2:48:30	**3.16E+04**	1.45E+01	4.46E+00	7.19E-02	1.44E+01	6.21E-01
85	2:52:30	**3.36E+04**	1.55E+01	4.31E+00	6.94E-02	1.54E+01	6.62E-01
87	2:56:30	**3.80E+04**	1.76E+01	4.16E+00	6.70E-02	1.75E+01	7.53E-01
89	3:00:30	**3.70E+04**	1.71E+01	4.02E+00	6.47E-02	1.70E+01	7.32E-01
91	3:04:30	**3.37E+04**	1.55E+01	3.88E+00	6.25E-02	1.55E+01	6.65E-01

Note: Figure 11 shows the plot of this data.

(a) Normalization is to first datum of normal region.

TABLE 10

TLD DATA OF THE ISCHEMIC REGION FOR EXPERIMENT 950728.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a) uCi	Myocardial Activity (a) Normalized
2	0:05:00	3.49E+04	1.61E+01	2.01E+01	7.91E-01	1.53E+01	6.58E-01
4	0:09:00	3.50E+04	1.61E+01	1.80E+01	7.09E-01	1.54E+01	6.64E-01
6	0:13:00	3.34E+04	1.54E+01	1.74E+01	6.85E-01	1.47E+01	6.32E-01
8	0:17:00	3.80E+04	1.76E+01	1.68E+01	2.70E-01	1.73E+01	7.44E-01
10	0:21:00	3.47E+04	1.60E+01	1.62E+01	2.61E-01	1.57E+01	6.77E-01
12	0:25:00	4.20E+04	1.95E+01	1.56E+01	2.52E-01	1.92E+01	8.27E-01
14	0:29:00	3.80E+04	1.76E+01	1.51E+01	2.43E-01	1.73E+01	7.45E-01
16	0:33:00	4.00E+04	1.85E+01	1.46E+01	2.35E-01	1.83E+01	7.87E-01
18	0:37:00	3.60E+04	1.66E+01	1.41E+01	2.27E-01	1.64E+01	7.05E-01
20	0:41:00	4.40E+04	2.04E+01	1.36E+01	2.19E-01	2.02E+01	8.69E-01
22	0:45:00	3.70E+04	1.71E+01	1.31E+01	2.11E-01	1.69E+01	7.26E-01
24	0:49:00	4.20E+04	1.95E+01	1.27E+01	2.04E-01	1.93E+01	8.29E-01
26	0:53:00	4.50E+04	2.09E+01	1.22E+01	1.97E-01	2.07E+01	8.91E-01
28	0:57:00	3.90E+04	1.80E+01	1.18E+01	1.90E-01	1.79E+01	7.68E-01
30	1:01:00	4.00E+04	1.85E+01	1.14E+01	1.84E-01	1.83E+01	7.89E-01
32	1:05:00	4.00E+04	1.85E+01	1.10E+01	1.77E-01	1.83E+01	7.89E-01
34	1:09:00	4.00E+04	1.85E+01	1.06E+01	1.71E-01	1.84E+01	7.89E-01
36	1:13:00	4.20E+04	1.95E+01	1.03E+01	1.66E-01	1.93E+01	8.31E-01
38	1:17:00	4.30E+04	2.00E+01	9.93E+00	1.60E-01	1.98E+01	8.51E-01
40	1:21:00	4.10E+04	1.90E+01	9.59E+00	1.54E-01	1.88E+01	8.11E-01
42	1:25:00	3.90E+04	1.80E+01	9.26E+00	1.49E-01	1.79E+01	7.70E-01
44	1:29:00	3.80E+04	1.76E+01	8.94E+00	1.44E-01	1.74E+01	7.49E-01
46	1:33:00	4.40E+04	2.04E+01	8.63E+00	1.39E-01	2.03E+01	8.73E-01
48	1:37:00	4.60E+04	2.14E+01	8.34E+00	1.34E-01	2.13E+01	9.14E-01
50	1:41:00	5.10E+04	2.38E+01	8.05E+00	1.30E-01	2.36E+01	1.02E+00
52	1:45:00	4.20E+04	1.95E+01	7.77E+00	1.25E-01	1.94E+01	8.32E-01
54	1:49:00	3.90E+04	1.80E+01	7.51E+00	1.21E-01	1.79E+01	7.71E-01
56	1:53:00	3.80E+04	1.76E+01	7.25E+00	1.17E-01	1.75E+01	7.51E-01
58	1:57:00	3.90E+04	1.80E+01	7.00E+00	1.13E-01	1.79E+01	7.71E-01
60	2:01:00	3.90E+04	1.80E+01	6.76E+00	1.09E-01	1.79E+01	7.71E-01
62	2:05:00	4.10E+04	1.90E+01	6.53E+00	1.05E-01	1.89E+01	8.13E-01
64	2:09:00	4.10E+04	1.90E+01	6.30E+00	1.01E-01	1.89E+01	8.13E-01
66	2:13:00	3.12E+03	9.27E-01	6.09E+00	9.80E-02	8.29E-01	3.56E-02
68	2:17:00	3.14E+03	9.36E-01	5.88E+00	9.46E-02	8.41E-01	3.62E-02
70	2:21:00	3.80E+04	1.76E+01	5.68E+00	9.14E-02	1.75E+01	7.52E-01
72	2:25:00	3.80E+04	1.76E+01	5.48E+00	8.82E-02	1.75E+01	7.52E-01
74	2:29:00	3.60E+04	1.66E+01	5.29E+00	8.52E-02	1.65E+01	7.11E-01
76	2:33:00	3.90E+04	1.80E+01	5.11E+00	8.23E-02	1.80E+01	7.73E-01
78	2:37:00	3.53E+04	1.63E+01	4.94E+00	7.95E-02	1.62E+01	6.97E-01
80	2:41:00	3.70E+04	1.71E+01	4.77E+00	7.67E-02	1.70E+01	7.32E-01
82	2:45:00	3.60E+04	1.66E+01	4.60E+00	7.41E-02	1.65E+01	7.11E-01
84	2:49:00	3.66E+04	1.69E+01	4.44E+00	7.16E-02	1.68E+01	7.24E-01
86	2:53:00	4.20E+04	1.95E+01	4.29E+00	6.91E-02	1.94E+01	8.35E-01
88	2:57:00	3.57E+04	1.65E+01	4.14E+00	6.67E-02	1.64E+01	7.06E-01
90	3:01:00	3.57E+04	1.65E+01	4.00E+00	6.44E-02	1.64E+01	7.06E-01
92	3:05:00	4.10E+04	1.90E+01	3.86E+00	6.22E-02	1.89E+01	8.14E-01

Note: Figure 11 shows the plot of this data.

(a) Normalization is to first datum of normal region (Table 9).

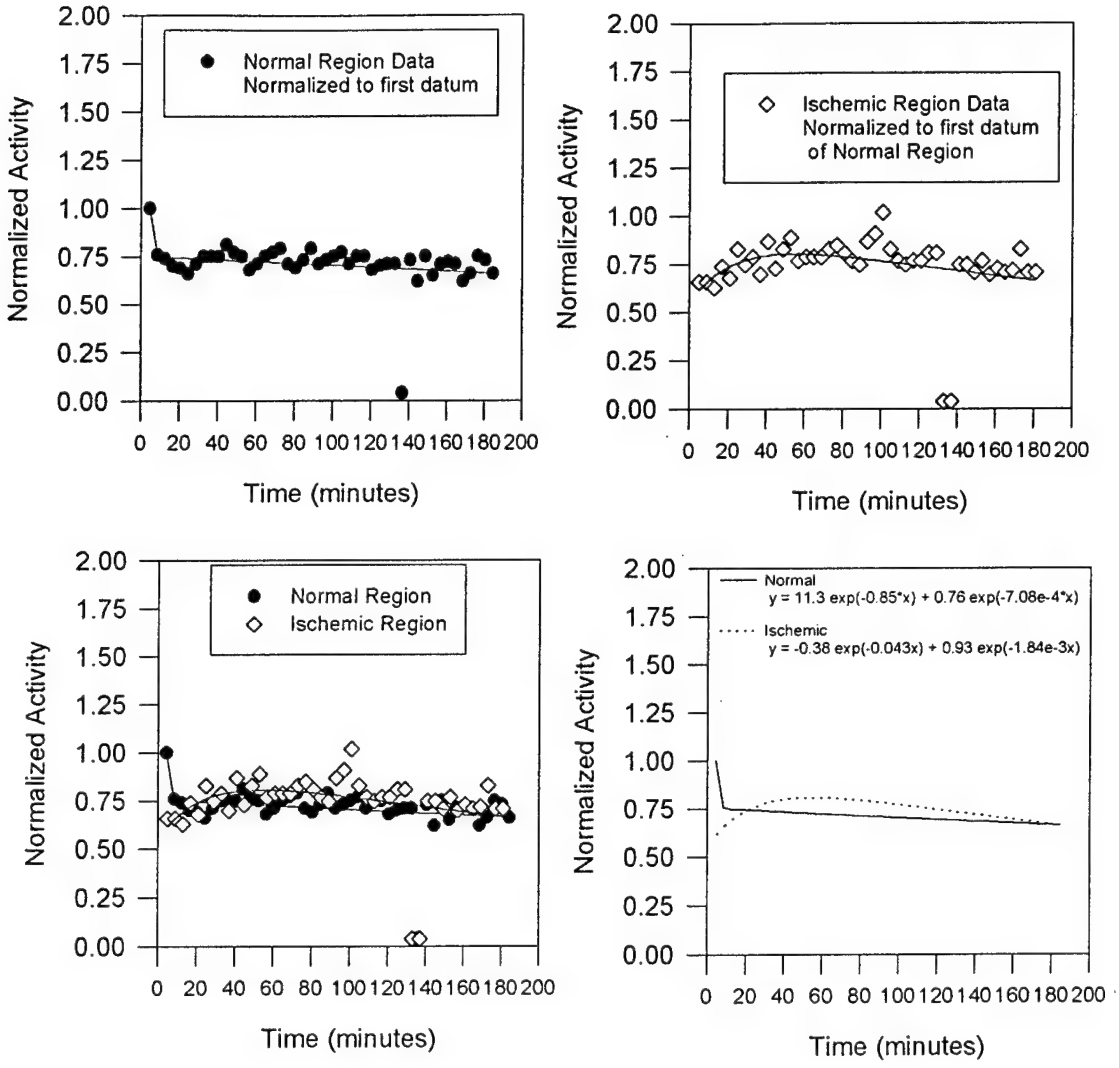

Figure 12: Above graphs are for experiment 950728. a. Normal Region Activity Clearance. b. Plot of Ischemic Region Clearance, c. Combine plot of Normal and Ishcemic d. Fit to the clearance of normal and ischemic region

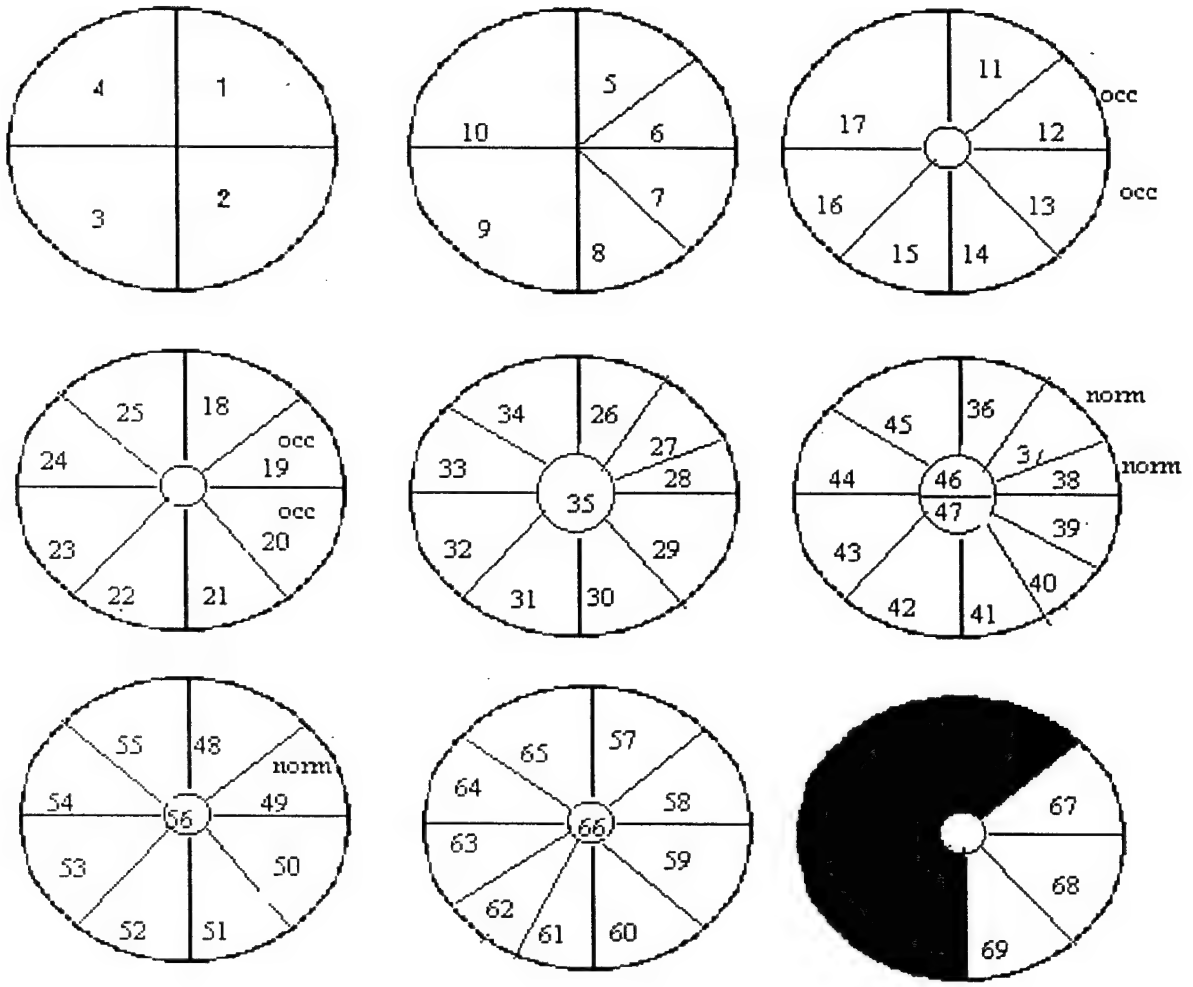

Figure 13: Dissection of the Heart for Experiment 950728. TLD placement for normal region is marked with 'norm' and LD placement for ischemic (occluded) region is marked with 'occ'.

TABLE 11

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950728

Segment	Segment	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath in dpm			
Number	Mass-g	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
1	2.9E-02	6.35E+04	3.48E+02	3.46E+01	5.98E+02	7.98E+03	0	0.5	0	1.15E+05	5.61E+02	5.66E+01	9.64E+02
2	2.1E-02	3.02E+04	5.72E+02	1.68E+01	5.75E+02	7.99E+03	0	1.5	0	6.15E+04	9.22E+02	2.95E+01	9.27E+02
3	2.3E-02	7.51E+04	3.38E+02	5.85E+01	5.11E+02	8.28E+03	0	0	0	1.34E+05	5.45E+02	9.44E+01	8.24E+02
4	2.0E-02	9.20E+04	1.89E+02	9.05E+01	5.66E+02	9.34E+03	0	0	1	1.64E+05	3.04E+02	1.46E+02	9.14E+02
5	2.6E-02	3.67E+04	4.37E+02	1.34E+01	6.17E+02	9.27E+03	0	4.4	3	7.41E+04	7.04E+02	2.87E+01	1.00E+03
6	3.5E-02	4.94E+04	6.65E+02	3.61E+01	8.70E+02	9.83E+03	0	1.5	0	9.55E+04	1.07E+03	6.06E+01	1.40E+03
7	3.6E-02	4.80E+04	6.05E+02	2.48E+01	9.28E+02	1.19E+04	0	1.5	0	9.66E+04	9.76E+02	4.24E+01	1.50E+03
8	2.5E-02	3.36E+04	6.38E+02	1.88E+01	9.10E+02	7.75E+03	0	0	1	6.67E+04	1.03E+03	3.03E+01	1.47E+03
9	1.9E-02	3.27E+04	5.00E+02	1.78E+02	7.42E+02	5.78E+03	0	3.5	0	6.21E+04	8.06E+02	2.92E+02	1.20E+03
10	2.7E-02	2.96E+04	5.34E+02	2.72E+01	9.04E+02	6.74E+03	0	0.3	3	5.87E+04	8.60E+02	4.44E+01	1.46E+03
11	3.5E-02	3.85E+04	7.01E+02	4.09E+01	9.79E+02	1.09E+04	0	0	0	7.97E+04	1.13E+03	6.60E+01	1.58E+03
12	4.4E-02	6.01E+04	8.83E+02	4.04E+01	1.09E+03	1.36E+04	0	0	0	1.19E+05	1.42E+03	6.52E+01	1.76E+03
13	4.9E-02	5.74E+04	1.07E+03	5.50E+01	1.49E+03	1.63E+04	0	0.5	0	1.19E+05	1.72E+03	8.95E+01	2.40E+03
14	4.1E-02	4.51E+04	9.82E+02	4.76E+01	1.25E+03	1.07E+04	0	0.5	1	8.99E+04	1.58E+03	7.76E+01	2.02E+03
15	2.7E-02	3.94E+04	8.68E+02	7.61E+02	1.08E+03	7.65E+03	0	1.3	3	7.60E+04	1.40E+03	1.23E+03	1.75E+03
16	2.7E-02	2.67E+04	6.71E+02	4.57E+02	1.08E+03	6.65E+03	0	2.5	0	5.38E+04	1.08E+03	7.40E+02	1.74E+03
17	5.0E-02	5.25E+04	8.86E+02	5.61E+01	1.35E+03	1.19E+04	0	0	0	1.04E+05	1.43E+03	9.05E+01	2.17E+03
18	6.9E-02	7.45E+04	1.55E+03	1.16E+02	2.09E+03	1.70E+04	0	2	9	1.47E+05	2.50E+03	1.90E+02	3.39E+03
19	5.2E-02	6.86E+04	1.31E+03	3.74E+01	1.39E+03	1.97E+04	0	5.3	4	1.42E+05	2.11E+03	6.89E+01	2.25E+03
20	5.3E-02	6.54E+04	1.21E+03	4.18E+01	1.54E+03	1.91E+04	0	0	0	1.36E+05	1.96E+03	6.74E+01	2.49E+03
21	5.0E-02	4.30E+04	1.07E+03	5.29E+01	1.53E+03	1.19E+04	0	1.5	0	8.85E+04	1.72E+03	8.77E+01	2.46E+03
22	4.7E-02	6.84E+04	1.33E+03	1.48E+03	1.67E+03	1.30E+04	0	0.5	0	1.31E+05	2.15E+03	2.38E+03	2.70E+03
23	5.2E-02	5.08E+04	1.02E+03	1.79E+03	1.45E+03	1.19E+04	0	0.3	4	1.01E+05	1.65E+03	2.89E+03	2.35E+03
24	5.0E-02	4.44E+04	1.02E+03	5.37E+02	1.40E+03	9.87E+03	0	9.5	0	8.76E+04	1.64E+03	8.81E+02	2.26E+03
25	4.3E-02	3.91E+04	7.70E+02	5.17E+01	1.14E+03	1.10E+04	0	0	0	8.07E+04	1.24E+03	8.34E+01	1.84E+03
26	4.2E-02	5.27E+04	1.07E+03	4.73E+01	1.36E+03	1.22E+04	0	0	8	1.05E+05	1.72E+03	7.63E+01	2.21E+03
27	4.5E-02	4.91E+04	8.54E+02	4.87E+02	1.16E+03	1.13E+04	0	0	0	9.75E+04	1.38E+03	7.86E+02	1.87E+03
28	3.7E-02	4.44E+04	7.81E+02	7.49E+02	1.09E+03	1.00E+04	0	0	0	8.77E+04	1.26E+03	1.21E+03	1.75E+03
29	4.8E-02	4.86E+04	1.18E+03	9.13E+02	1.55E+03	1.30E+04	0	0.2	5	9.93E+04	1.91E+03	1.47E+03	2.51E+03
30	3.6E-02	3.50E+04	7.81E+02	4.76E+02	1.01E+03	8.64E+03	0	2.5	0	7.04E+04	1.26E+03	7.71E+02	1.63E+03
31	2.2E-02	4.96E+04	6.83E+02	1.24E+03	9.32E+02	8.62E+03	0	0	1	9.38E+04	1.10E+03	2.00E+03	1.50E+03
32	2.2E-02	2.37E+04	3.78E+02	8.83E+02	5.84E+02	7.16E+03	0	0	0	4.98E+04	6.10E+02	1.42E+03	9.41E+02
33	2.7E-02	2.81E+04	7.11E+02	4.77E+02	7.92E+02	5.30E+03	0	1.5	0	5.39E+04	1.15E+03	7.72E+02	1.28E+03
34	2.7E-02	3.06E+04	3.56E+02	3.42E+01	5.34E+02	6.25E+03	0	0	3	5.94E+04	5.74E+02	5.52E+01	8.67E+02
35	1.7E-02	1.18E+04	2.54E+02	2.70E+01	5.92E+02	3.06E+03	0	3.3	4	2.40E+04	4.10E+02	4.89E+01	9.61E+02
36	3.1E-02	3.40E+04	4.65E+02	2.63E+02	6.45E+02	6.01E+03	0	1.4	2	6.45E+04	7.50E+02	4.27E+02	1.04E+03

TABLE 11-CONTINUED

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950728

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath Activity in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
37	2.6E-02	2.69E+04	4.59E+02	4.43E+01	4.97E+02	5.71E+03	0	0.4	1	5.26E+04	7.40E+02	7.21E+01	8.04E+02
38	3.9E-02	5.29E+04	6.68E+02	4.25E+02	7.46E+02	1.10E+04	0	0.5	0	1.03E+05	1.08E+03	6.86E+02	1.20E+03
39	4.0E-02	4.88E+04	6.91E+02	1.33E+03	9.88E+02	1.03E+04	0	3.4	2	9.54E+04	1.11E+03	2.15E+03	1.60E+03
40	2.3E-02	3.68E+04	5.99E+02	1.05E+03	7.42E+02	9.35E+03	0	0	0	7.45E+04	9.67E+02	1.69E+03	1.20E+03
41	2.2E-02	2.87E+04	9.12E+02	1.35E+03	1.28E+03	8.35E+03	0	1.5	0	5.97E+04	1.47E+03	2.18E+03	2.07E+03
42	3.1E-02	7.49E+04	1.01E+03	1.90E+03	1.30E+03	1.14E+04	0	4.5	1	1.39E+05	1.63E+03	3.07E+03	2.10E+03
43	4.3E-02	5.88E+04	8.94E+02	1.99E+03	1.22E+03	1.18E+04	0	0	0	1.14E+05	1.44E+03	3.21E+03	1.96E+03
44	4.4E-02	5.10E+04	7.75E+02	1.59E+03	1.06E+03	9.18E+03	0	4.4	2	9.70E+04	1.25E+03	2.57E+03	1.72E+03
45	4.1E-02	4.06E+04	1.06E+03	1.48E+03	1.39E+03	7.38E+03	0	0.4	2	7.74E+04	1.71E+03	2.38E+03	2.24E+03
46	1.5E-02	1.16E+04	2.58E+02	2.77E+01	4.39E+02	3.70E+03	0	0	0	2.48E+04	4.16E+02	4.47E+01	7.07E+02
47	2.3E-02	1.90E+04	5.13E+02	8.19E+02	6.05E+02	5.09E+03	0	1.5	0	3.88E+04	8.28E+02	1.32E+03	9.76E+02
48	6.4E-02	9.03E+04	1.55E+03	2.39E+03	1.84E+03	1.31E+04	0	6.5	1	1.67E+05	2.50E+03	3.86E+03	2.96E+03
49	4.9E-02	6.36E+04	8.94E+02	1.62E+03	1.25E+03	1.29E+04	0	0	1	1.23E+05	1.44E+03	2.62E+03	2.02E+03
50	3.7E-02	7.23E+04	9.65E+02	1.66E+03	1.30E+03	1.49E+04	0	1.3	3	1.41E+05	1.56E+03	2.69E+03	2.11E+03
51	4.5E-02	8.54E+04	9.35E+02	1.72E+03	1.32E+03	1.28E+04	0	1.5	0	1.58E+05	1.51E+03	2.77E+03	2.13E+03
52	2.8E-02	3.40E+04	6.17E+02	1.22E+03	7.48E+02	7.61E+03	0	5.5	1	6.71E+04	9.95E+02	1.98E+03	1.21E+03
53	2.4E-02	2.17E+04	5.29E+02	7.78E+02	6.64E+02	7.01E+03	0	4.5	0	4.64E+04	8.53E+02	1.26E+03	1.07E+03
54	3.4E-02	3.75E+04	8.27E+02	1.52E+03	1.07E+03	7.67E+03	0	2.5	0	7.28E+04	1.33E+03	2.46E+03	1.72E+03
55	6.3E-02	8.14E+04	1.04E+03	2.09E+03	1.21E+03	1.11E+04	0	0	7	1.49E+05	1.67E+03	3.38E+03	1.97E+03
56	2.8E-02	2.75E+04	5.03E+02	9.39E+02	7.90E+02	5.43E+03	0	0.3	3	5.31E+04	8.11E+02	1.52E+03	1.28E+03
57	5.8E-02	8.54E+04	1.12E+03	2.55E+03	1.52E+03	1.50E+04	0	0	4	1.62E+05	1.80E+03	4.12E+03	2.45E+03
58	4.3E-02	5.55E+04	8.80E+02	1.66E+03	1.12E+03	1.14E+04	0	8.5	1	1.08E+05	1.42E+03	2.69E+03	1.81E+03
59	4.9E-02	1.32E+05	1.48E+03	2.69E+03	1.80E+03	1.62E+04	0	0	2	2.39E+05	2.39E+03	4.34E+03	2.91E+03
60	5.7E-02	8.61E+04	1.32E+03	2.76E+03	1.54E+03	1.35E+04	0	0	2	1.61E+05	2.14E+03	4.45E+03	2.49E+03
61	5.0E-02	5.87E+04	1.17E+03	2.42E+03	1.69E+03	1.12E+04	0	0	0	1.13E+05	1.89E+03	3.91E+03	2.72E+03
62	4.6E-02	4.40E+04	9.11E+02	1.92E+03	1.25E+03	1.10E+04	0	6.5	1	8.88E+04	1.47E+03	3.11E+03	2.01E+03
63	5.3E-02	6.04E+04	9.91E+02	2.08E+03	1.40E+03	1.65E+04	0	9.6	0	1.24E+05	1.60E+03	3.37E+03	2.25E+03
64	7.1E-02	2.56E+05	9.91E+02	2.49E+03	1.59E+03	2.07E+04	0	1.3	4	4.46E+05	1.60E+03	4.03E+03	2.56E+03
65	5.9E-02	3.06E+05	9.02E+02	2.26E+03	1.31E+03	1.70E+04	0	8.5	0	5.22E+05	1.45E+03	3.66E+03	2.12E+03
66	1.4E-02	2.05E+04	3.10E+02	5.71E+02	3.52E+02	7.94E+03	0	1.5	0	4.59E+04	5.00E+02	9.23E+02	5.67E+02
67	4.7E-02	8.35E+04	7.31E+02	1.80E+03	1.20E+03	1.28E+04	0	16.3	3.9	1.55E+05	1.18E+03	2.93E+03	1.94E+03
68	4.5E-02	6.84E+04	9.68E+02	2.06E+03	1.42E+03	1.30E+04	0	0.5	0	1.31E+05	1.56E+03	3.32E+03	2.29E+03
69	5.8E-02	8.61E+04	9.25E+02	2.02E+03	1.51E+03	1.53E+04	0	0	0	1.64E+05	1.49E+03	3.26E+03	2.44E+03
Totals	2.67E+00									7.60E+06	9.04E+04	1.05E+05	1.23E+05

TABLE 12

REFERENCE BLOOD ACTIVITY

(Experiment 950728)

Microshpere Blood Counts		
Cr-51	Ru-103	Nb-95
1.14E+03	3.40E+03	1.91E+03
1.11E+03	3.43E+03	1.97E+03
1.15E+03	3.39E+03	1.98E+03
1.19E+03	3.56E+03	1.95E+03
1.17E+03	3.60E+03	1.99E+03
1.17E+03	3.44E+03	2.03E+03
1.23E+03	3.40E+03	2.01E+03
1.12E+03	3.24E+03	2.02E+03
1.13E+03	3.45E+03	1.80E+03
8.14E+02	2.65E+03	1.78E+03
9.54E+02	3.18E+03	1.75E+03
8.98E+02	3.09E+03	1.81E+03
9.47E+02	3.01E+03	1.80E+03
5.26E+02	2.57E+03	1.82E+03
8.36E+02	2.00E+03	2.13E+03
1.80E+02	4.40E+03	2.16E+03
		1.22E+03
		1.64E+03
Totals:	1.56E+04	5.18E+04	3.38E+04
Activity(dpm):	2.51E+04	8.36E+04	5.44E+04
Volumes(ml):	3.00E+00	5.20E+00	6.00E+00

TABLE 13

ABSOLUTE FLOWS AND TC-99m DISTRIBUTION IN MYOCARDIUM

(Experiment 950728)

Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95	Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95
1	1.40E+00	7.71E-01	4.05E-02	1.22E+00	36	7.32E-01	9.64E-01	2.86E-01	1.24E+00
2	1.03E+00	1.75E+00	2.92E-02	1.62E+00	37	7.11E-01	1.13E+00	5.75E-02	1.14E+00
3	2.05E+00	9.44E-01	8.51E-02	1.32E+00	38	9.28E-01	1.10E+00	3.65E-01	1.13E+00
4	2.88E+00	6.06E-01	1.51E-01	1.68E+00	39	8.38E-01	1.11E+00	1.11E+00	1.47E+00
5	1.00E+00	1.08E+00	2.29E-02	1.41E+00	40	1.14E+00	1.67E+00	1.53E+00	1.91E+00
6	9.59E-01	1.22E+00	3.59E-02	1.47E+00	41	9.54E-01	2.66E+00	2.06E+00	3.46E+00
7	9.44E-01	1.08E+00	2.44E-02	1.53E+00	42	1.58E+00	2.10E+00	2.05E+00	2.49E+00
8	9.37E-01	1.64E+00	2.52E-02	2.16E+00	43	9.31E-01	1.34E+00	1.55E+00	1.68E+00
9	1.15E+00	1.69E+00	3.19E-01	2.31E+00	44	7.75E-01	1.13E+00	1.21E+00	1.43E+00
10	7.64E-01	1.27E+00	3.41E-02	1.99E+00	45	6.64E-01	1.66E+00	1.20E+00	2.01E+00
11	8.01E-01	1.29E+00	3.91E-02	1.66E+00	46	5.80E-01	1.11E+00	6.18E-02	1.73E+00
12	9.49E-01	1.29E+00	3.07E-02	1.47E+00	47	5.93E-01	1.43E+00	1.19E+00	1.56E+00
13	8.52E-01	1.40E+00	3.79E-02	1.80E+00	48	9.17E-01	1.56E+00	1.25E+00	1.70E+00
14	7.71E-01	1.54E+00	3.92E-02	1.81E+00	49	8.85E-01	1.17E+00	1.11E+00	1.52E+00
15	9.89E-01	2.06E+00	9.44E-01	2.38E+00	50	1.34E+00	1.68E+00	1.51E+00	2.09E+00
16	7.01E-01	1.60E+00	5.69E-01	2.37E+00	51	1.24E+00	1.33E+00	1.28E+00	1.74E+00
17	7.31E-01	1.14E+00	3.75E-02	1.59E+00	52	8.43E-01	1.42E+00	1.46E+00	1.59E+00
18	7.52E-01	1.44E+00	5.70E-02	1.81E+00	53	6.79E-01	1.42E+00	1.09E+00	1.64E+00
19	9.62E-01	1.62E+00	2.75E-02	1.59E+00	54	7.53E-01	1.56E+00	1.50E+00	1.86E+00
20	9.05E-01	1.47E+00	2.64E-02	1.73E+00	55	8.33E-01	1.06E+00	1.11E+00	1.15E+00
21	6.22E-01	1.37E+00	3.64E-02	1.81E+00	56	6.67E-01	1.15E+00	1.12E+00	1.68E+00
22	9.81E-01	1.82E+00	1.05E+00	2.11E+00	57	9.82E-01	1.24E+00	1.47E+00	1.55E+00
23	6.84E-01	1.26E+00	1.15E+00	1.66E+00	58	8.81E-01	1.31E+00	1.30E+00	1.55E+00
24	6.16E-01	1.31E+00	3.65E-01	1.66E+00	59	1.72E+00	1.94E+00	1.84E+00	2.18E+00
25	6.60E-01	1.15E+00	4.02E-02	1.57E+00	60	9.91E-01	1.49E+00	1.62E+00	1.60E+00
26	8.76E-01	1.63E+00	3.77E-02	1.93E+00	61	7.93E-01	1.51E+00	1.62E+00	2.00E+00
27	7.62E-01	1.22E+00	3.62E-01	1.53E+00	62	6.79E-01	1.27E+00	1.40E+00	1.61E+00
28	8.34E-01	1.36E+00	6.77E-01	1.74E+00	63	8.23E-01	1.20E+00	1.32E+00	1.56E+00
29	7.27E-01	1.58E+00	6.37E-01	1.92E+00	64	2.21E+00	8.96E-01	1.18E+00	1.33E+00
30	6.88E-01	1.39E+00	4.44E-01	1.67E+00	65	3.11E+00	9.82E-01	1.29E+00	1.32E+00
31	1.50E+00	1.99E+00	1.89E+00	2.51E+00	66	1.15E+00	1.42E+00	1.37E+00	1.49E+00
32	7.96E-01	1.10E+00	1.34E+00	1.57E+00	67	1.16E+00	9.99E-01	1.29E+00	1.51E+00
33	7.01E-01	1.69E+00	5.93E-01	1.74E+00	68	1.03E+00	1.38E+00	1.53E+00	1.87E+00
34	7.74E-01	8.47E-01	4.24E-02	1.18E+00	69	9.92E-01	1.03E+00	1.17E+00	1.55E+00
35	4.96E-01	9.61E-01	5.96E-02	2.08E+00					

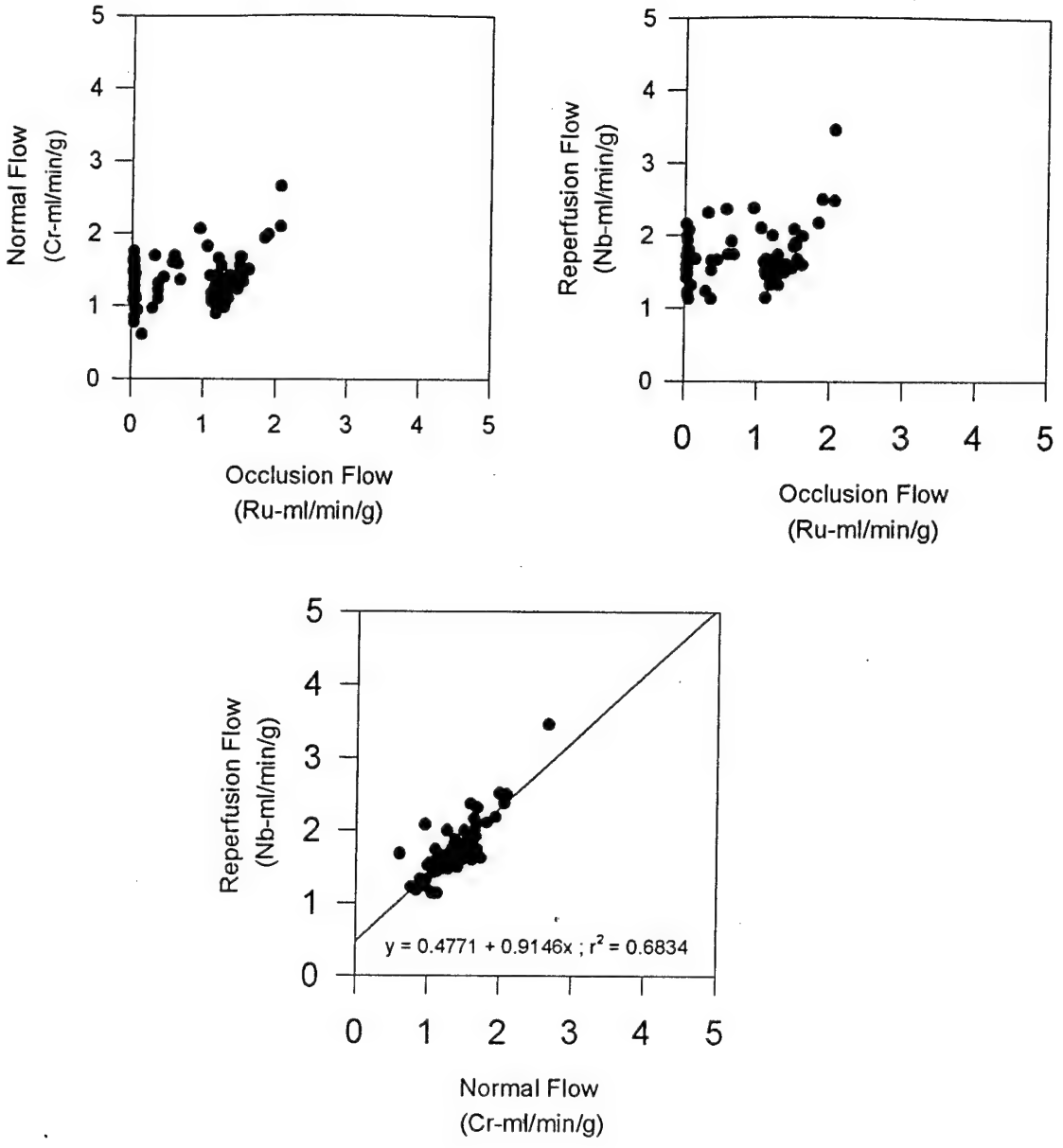

Figure 14: Above graphs are the reference blood comparisons flows for Experiment 950728. a. Plot of normal reference blood flow vs occlusion flow, b. Plot of reperfusion flow vs occlusion flow, c. Plot of reperfusion flow vs normal flow.

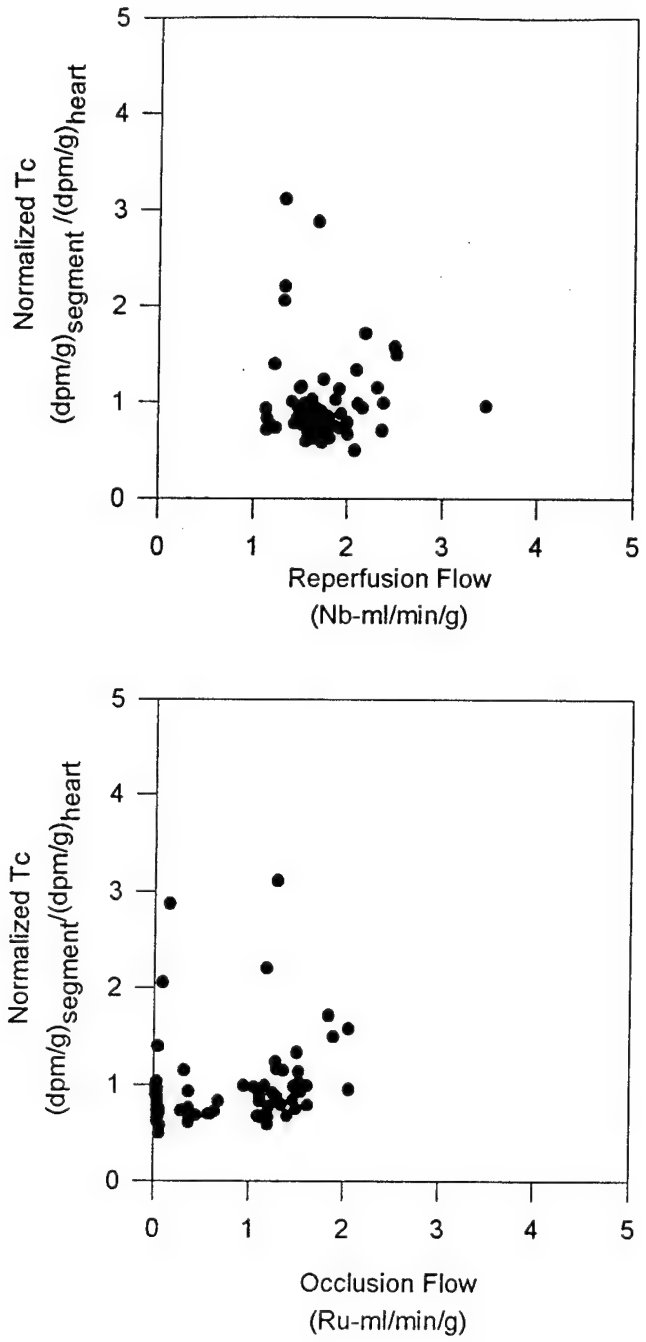

Figure 15: Above graphs are comparisons of Tc-99m distribution in each heart segment to the reference blood flows in the segment for Experiment 950728. a. Plot of normalized Tc vs reperfusion flow b. Plot of normalized Tc vs occlusion flow

Appendix 3

Data Tables and Illustrations for Experiment 950731

TABLE 14

BLOOD CLEARANCE FOR EXPERIMENT 950731.

Sample #	Lapse Time HH:MM:SS	Measurement CPM	Corrected (a) DPM	Tube-Blood Mass in g	Tube Mass g	Blood Mass g	Calculated dpm/mg	Fit Data dpm/mg
1	0:04:30	**2.03E+06**	8.25E+07	**3.08E+00**	**2.72E+00**	3.52E-01	2.34E+05	2.34E+05
2	0:05:00	**9.36E+05**	3.81E+07	**3.08E+00**	**2.68E+00**	3.99E-01	9.54E+04	9.77E+04
3	0:06:00	**4.05E+05**	1.64E+07	**3.10E+00**	**2.68E+00**	4.17E-01	3.94E+04	3.40E+04
4	0:07:00	**2.90E+05**	1.18E+07	**3.06E+00**	**2.68E+00**	3.80E-01	3.10E+04	2.63E+04
5	0:08:00	**2.42E+05**	9.78E+06	**3.12E+00**	**2.72E+00**	4.01E-01	2.44E+04	2.52E+04
6	0:09:00	**2.45E+05**	9.89E+06	**3.14E+00**	**2.68E+00**	4.57E-01	2.16E+04	2.50E+04
7	0:10:00	**2.00E+05**	8.06E+06	**3.05E+00**	**2.70E+00**	3.49E-01	2.31E+04	2.49E+04
8	0:11:00	**2.29E+05**	9.23E+06	**3.12E+00**	**2.72E+00**	3.98E-01	2.32E+04	2.48E+04
9	0:12:00	**1.89E+05**	7.59E+06	**3.04E+00**	**2.68E+00**	3.58E-01	2.12E+04	2.47E+04
10	0:13:00	**2.14E+05**	8.58E+06	**3.10E+00**	**2.72E+00**	3.80E-01	2.26E+04	2.46E+04
11	0:14:00	**1.79E+05**	7.16E+06	**3.00E+00**	**2.68E+00**	3.19E-01	2.25E+04	2.45E+04
12	0:19:00	**2.91E+05**	1.15E+07	**3.14E+00**	**2.70E+00**	4.41E-01	2.62E+04	2.39E+04
13	0:24:00	**2.41E+05**	9.43E+06	**3.09E+00**	**2.69E+00**	3.94E-01	2.39E+04	2.34E+04
14	0:29:00	**2.46E+05**	9.54E+06	**3.06E+00**	**2.67E+00**	3.90E-01	2.45E+04	2.29E+04
15	0:34:00	**2.68E+05**	1.03E+07	**3.11E+00**	**2.70E+00**	4.06E-01	2.53E+04	2.24E+04
16	0:49:00	**2.21E+05**	8.28E+06	**3.05E+00**	**2.69E+00**	3.60E-01	2.30E+04	2.10E+04
17	1:04:00	**2.96E+05**	1.07E+07	**3.20E+00**	**2.67E+00**	5.33E-01	2.01E+04	1.97E+04
18	1:19:00	**2.03E+05**	7.15E+06	**3.11E+00**	**2.68E+00**	4.25E-01	1.68E+04	1.84E+04
19	1:34:00	**2.47E+05**	8.45E+06	**3.20E+00**	**2.69E+00**	5.11E-01	1.65E+04	1.73E+04
20	1:49:00	**2.03E+05**	6.76E+06	**3.11E+00**	**2.68E+00**	4.24E-01	1.59E+04	1.62E+04
21	2:04:00	**1.74E+05**	5.64E+06	**3.10E+00**	**2.70E+00**	4.02E-01	1.40E+04	1.52E+04
22	2:19:00	**1.86E+05**	5.83E+06	**3.12E+00**	**2.70E+00**	4.27E-01	1.37E+04	1.42E+04
23	2:34:00	**1.86E+05**	5.68E+06	**3.10E+00**	**2.72E+00**	3.82E-01	1.49E+04	1.33E+04
24	2:49:00	**1.78E+05**	5.29E+06	**3.16E+00**	**2.72E+00**	4.39E-01	1.20E+04	1.25E+04
25	3:04:00	**1.90E+05**	5.47E+06	**3.18E+00**	**2.73E+00**	4.58E-01	1.19E+04	1.17E+04

Note: The blood specific activity (dpm/mg) is plotted against time in figure 15.

(a) 99m Tc Half-life (hrs) 6.01
Collection to Counting Time (hrs) **28.00**
Detector Efficiency (Counts/Decay) 0.62

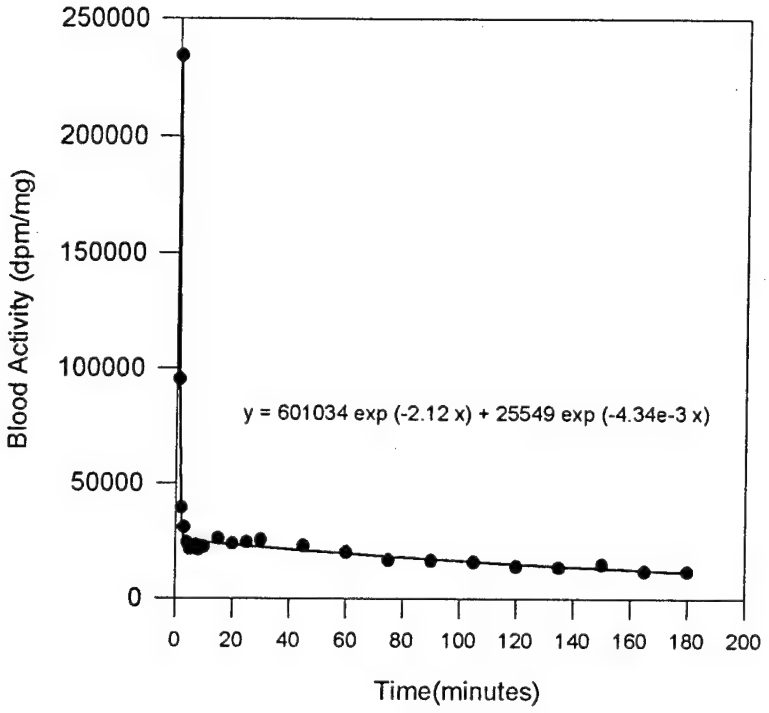

Figure 16: Blood Clearance for Experiment 950731.

TABLE 15

TLD DATA OF THE NORMAL REGION FOR EXPERIMENT 950731.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a)	
						uCi	Normalized
1	0:04:30	**5.20E+04**	2.42E+01	4.19E+01	6.74E-01	2.36E+01	1.00E+00
3	0:08:30	**4.10E+04**	1.90E+01	1.41E+01	2.28E-01	1.88E+01	7.96E-01
5	0:12:30	**4.00E+04**	1.85E+01	1.39E+01	2.24E-01	1.83E+01	7.76E-01
7	0:16:30	**4.10E+04**	1.90E+01	1.37E+01	2.20E-01	1.88E+01	7.97E-01
9	0:20:30	**4.10E+04**	1.90E+01	1.34E+01	2.16E-01	1.88E+01	7.97E-01
11	0:24:30	**4.10E+04**	1.90E+01	1.32E+01	2.12E-01	1.88E+01	7.97E-01
13	0:28:30	**4.20E+04**	1.95E+01	1.30E+01	2.09E-01	1.93E+01	8.17E-01
15	0:32:30	**4.70E+04**	2.19E+01	1.27E+01	2.05E-01	2.17E+01	9.19E-01
17	0:36:30	**4.60E+04**	2.14E+01	1.25E+01	2.02E-01	2.12E+01	8.99E-01
19	0:40:30	**4.20E+04**	1.95E+01	1.23E+01	1.98E-01	1.93E+01	8.18E-01
21	0:44:30	**4.60E+04**	2.14E+01	1.21E+01	1.95E-01	2.12E+01	8.99E-01
23	0:48:30	**4.50E+04**	2.09E+01	1.19E+01	1.91E-01	2.07E+01	8.79E-01
25	0:52:30	**4.30E+04**	2.00E+01	1.17E+01	1.88E-01	1.98E+01	8.38E-01
27	0:56:30	**3.68E+04**	1.70E+01	1.15E+01	1.85E-01	1.68E+01	7.13E-01
29	1:00:30	**4.20E+04**	1.95E+01	1.13E+01	1.82E-01	1.93E+01	8.18E-01
31	1:04:30	**4.10E+04**	1.90E+01	1.11E+01	1.78E-01	1.88E+01	7.98E-01
33	1:08:30	**3.69E+04**	1.70E+01	1.09E+01	1.75E-01	1.69E+01	7.16E-01
35	1:12:30	**4.50E+04**	2.09E+01	1.07E+01	1.72E-01	2.07E+01	8.80E-01
37	1:16:30	**4.00E+04**	1.85E+01	1.05E+01	1.69E-01	1.84E+01	7.79E-01
39	1:20:30	**3.90E+04**	1.80E+01	1.03E+01	1.66E-01	1.79E+01	7.58E-01
41	1:24:30	**4.30E+04**	2.00E+01	1.02E+01	1.64E-01	1.98E+01	8.39E-01
43	1:28:30	**3.90E+04**	1.80E+01	9.99E+00	1.61E-01	1.79E+01	7.59E-01
45	1:32:30	**4.30E+04**	2.00E+01	9.82E+00	1.58E-01	1.98E+01	8.40E-01
47	1:36:30	**4.60E+04**	2.14E+01	9.65E+00	1.55E-01	2.12E+01	9.01E-01
49	1:40:30	**4.00E+04**	1.85E+01	9.48E+00	1.53E-01	1.84E+01	7.79E-01
51	1:44:30	**3.70E+04**	1.71E+01	9.32E+00	1.50E-01	1.69E+01	7.19E-01
53	1:48:30	**4.00E+04**	1.85E+01	9.16E+00	1.47E-01	1.84E+01	7.79E-01
55	1:52:30	**4.00E+04**	1.85E+01	9.00E+00	1.45E-01	1.84E+01	7.80E-01
57	1:56:30	**4.20E+04**	1.95E+01	8.84E+00	1.42E-01	1.93E+01	8.20E-01
59	2:00:30	**3.66E+04**	1.69E+01	8.69E+00	1.40E-01	1.68E+01	7.11E-01
61	2:04:30	**4.60E+04**	2.14E+01	8.54E+00	1.38E-01	2.12E+01	9.01E-01
63	2:08:30	**3.60E+04**	1.66E+01	8.40E+00	1.35E-01	1.65E+01	6.99E-01
65	2:12:30	**3.69E+04**	1.70E+01	8.25E+00	1.33E-01	1.69E+01	7.17E-01
67	2:16:30	**3.65E+04**	1.69E+01	8.11E+00	1.31E-01	1.67E+01	7.09E-01
69	2:20:30	**3.60E+04**	1.66E+01	7.97E+00	1.28E-01	1.65E+01	6.99E-01
71	2:24:30	**4.00E+04**	1.85E+01	7.83E+00	1.26E-01	1.84E+01	7.80E-01
73	2:28:30	**3.70E+04**	1.71E+01	7.70E+00	1.24E-01	1.70E+01	7.20E-01
75	2:32:30	**3.49E+04**	1.61E+01	7.56E+00	1.22E-01	1.60E+01	6.77E-01
77	2:36:30	**3.80E+04**	1.76E+01	7.43E+00	1.20E-01	1.74E+01	7.40E-01
79	2:40:30	**3.12E+04**	1.43E+01	7.31E+00	1.18E-01	1.42E+01	6.03E-01
81	2:44:30	**3.80E+04**	1.76E+01	7.18E+00	1.16E-01	1.75E+01	7.40E-01
83	2:48:30	**4.00E+04**	1.85E+01	7.06E+00	1.14E-01	1.84E+01	7.81E-01
85	2:52:30	**3.80E+04**	1.76E+01	6.93E+00	1.12E-01	1.75E+01	7.41E-01
87	2:56:30	**3.51E+04**	1.62E+01	6.82E+00	1.10E-01	1.61E+01	6.82E-01
89	3:00:30	**3.41E+04**	1.57E+01	6.70E+00	1.08E-01	1.56E+01	6.62E-01
91	3:04:30	**3.60E+04**	1.66E+01	6.58E+00	1.06E-01	1.65E+01	7.00E-01

Note: Figure 16 shows the plot of this data.

(a) Normalization is to first datum of normal region.

TABLE 16

TLD DATA OF THE ISCHEMIC REGION FOR EXPERIMENT 950731.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a)	
						uCi	Normalized
2	0:05:00	**4.20E+04**	1.95E+01	2.39E+01	9.41E-01	1.85E+01	7.86E-01
4	0:09:00	**3.53E+04**	1.63E+01	1.41E+01	5.56E-01	1.57E+01	6.67E-01
6	0:13:00	**3.70E+04**	1.71E+01	1.39E+01	5.47E-01	1.65E+01	7.02E-01
8	0:17:00	**4.10E+04**	1.90E+01	1.36E+01	2.19E-01	1.88E+01	7.97E-01
10	0:21:00	**5.10E+04**	2.38E+01	1.34E+01	2.16E-01	2.36E+01	9.99E-01
12	0:25:00	**4.70E+04**	2.19E+01	1.32E+01	2.12E-01	2.16E+01	9.19E-01
14	0:29:00	**4.40E+04**	2.04E+01	1.29E+01	2.08E-01	2.02E+01	8.58E-01
16	0:33:00	**4.00E+04**	1.85E+01	1.27E+01	2.05E-01	1.83E+01	7.77E-01
18	0:37:00	**4.10E+04**	1.90E+01	1.25E+01	2.01E-01	1.88E+01	7.98E-01
20	0:41:00	**3.80E+04**	1.76E+01	1.23E+01	1.98E-01	1.74E+01	7.37E-01
22	0:45:00	**4.40E+04**	2.04E+01	1.21E+01	1.94E-01	2.02E+01	8.59E-01
24	0:49:00	**3.70E+04**	1.71E+01	1.19E+01	1.91E-01	1.69E+01	7.17E-01
26	0:53:00	**3.61E+04**	1.67E+01	1.17E+01	1.88E-01	1.65E+01	6.99E-01
28	0:57:00	**4.33E+04**	2.01E+01	1.15E+01	1.84E-01	1.99E+01	8.45E-01
30	1:01:00	**4.10E+04**	1.90E+01	1.13E+01	1.81E-01	1.88E+01	7.98E-01
32	1:05:00	**4.40E+04**	2.04E+01	1.11E+01	1.78E-01	2.03E+01	8.59E-01
34	1:09:00	**4.60E+04**	2.14E+01	1.09E+01	1.75E-01	2.12E+01	9.00E-01
36	1:13:00	**4.30E+04**	2.00E+01	1.07E+01	1.72E-01	1.98E+01	8.39E-01
38	1:17:00	**4.60E+04**	2.14E+01	1.05E+01	1.69E-01	2.12E+01	9.00E-01
40	1:21:00	**4.50E+04**	2.09E+01	1.03E+01	1.66E-01	2.07E+01	8.80E-01
42	1:25:00	**3.80E+04**	1.76E+01	1.01E+01	1.63E-01	1.74E+01	7.38E-01
44	1:29:00	**4.00E+04**	1.85E+01	9.97E+00	1.60E-01	1.84E+01	7.79E-01
46	1:33:00	**4.30E+04**	2.00E+01	9.79E+00	1.58E-01	1.98E+01	8.40E-01
48	1:37:00	**4.60E+04**	2.14E+01	9.63E+00	1.55E-01	2.12E+01	9.01E-01
50	1:41:00	**4.00E+04**	1.85E+01	9.46E+00	1.52E-01	1.84E+01	7.79E-01
52	1:45:00	**4.70E+04**	2.19E+01	9.30E+00	1.50E-01	2.17E+01	9.21E-01
54	1:49:00	**4.30E+04**	2.00E+01	9.14E+00	1.47E-01	1.98E+01	8.40E-01
56	1:53:00	**4.40E+04**	2.04E+01	8.98E+00	1.45E-01	2.03E+01	8.61E-01
58	1:57:00	**4.20E+04**	1.95E+01	8.83E+00	1.42E-01	1.93E+01	8.20E-01
60	2:01:00	**4.50E+04**	2.09E+01	8.67E+00	1.40E-01	2.08E+01	8.81E-01
62	2:05:00	**3.70E+04**	1.71E+01	8.52E+00	1.37E-01	1.70E+01	7.19E-01
64	2:09:00	**4.10E+04**	1.90E+01	8.38E+00	1.35E-01	1.89E+01	8.00E-01
66	2:13:00	**3.80E+04**	1.76E+01	8.23E+00	1.33E-01	1.74E+01	7.40E-01
68	2:17:00	**3.90E+04**	1.80E+01	8.09E+00	1.30E-01	1.79E+01	7.60E-01
70	2:21:00	**4.30E+04**	2.00E+01	7.95E+00	1.28E-01	1.98E+01	8.41E-01
72	2:25:00	**4.10E+04**	1.90E+01	7.81E+00	1.26E-01	1.89E+01	8.01E-01
74	2:29:00	**3.90E+04**	1.80E+01	7.68E+00	1.24E-01	1.79E+01	7.60E-01
76	2:33:00	**3.72E+04**	1.72E+01	7.55E+00	1.22E-01	1.71E+01	7.24E-01
78	2:37:00	**3.90E+04**	1.80E+01	7.42E+00	1.19E-01	1.79E+01	7.61E-01
80	2:41:00	**4.00E+04**	1.85E+01	7.29E+00	1.17E-01	1.84E+01	7.81E-01
82	2:45:00	**3.70E+04**	1.71E+01	7.16E+00	1.15E-01	1.70E+01	7.20E-01
84	2:49:00	**3.70E+04**	1.71E+01	7.04E+00	1.13E-01	1.70E+01	7.20E-01
86	2:53:00	**4.30E+04**	2.00E+01	6.92E+00	1.11E-01	1.98E+01	8.42E-01
88	2:57:00	**3.80E+04**	1.76E+01	6.80E+00	1.09E-01	1.75E+01	7.41E-01
90	3:01:00	**3.80E+04**	1.76E+01	6.68E+00	1.08E-01	1.75E+01	7.41E-01
92	3:05:00	**3.66E+04**	1.69E+01	6.57E+00	1.06E-01	1.68E+01	7.13E-01

Note: Figure 15 shows the plot of this data.

(a) Normalization is to first datum of normal region (Table 15).

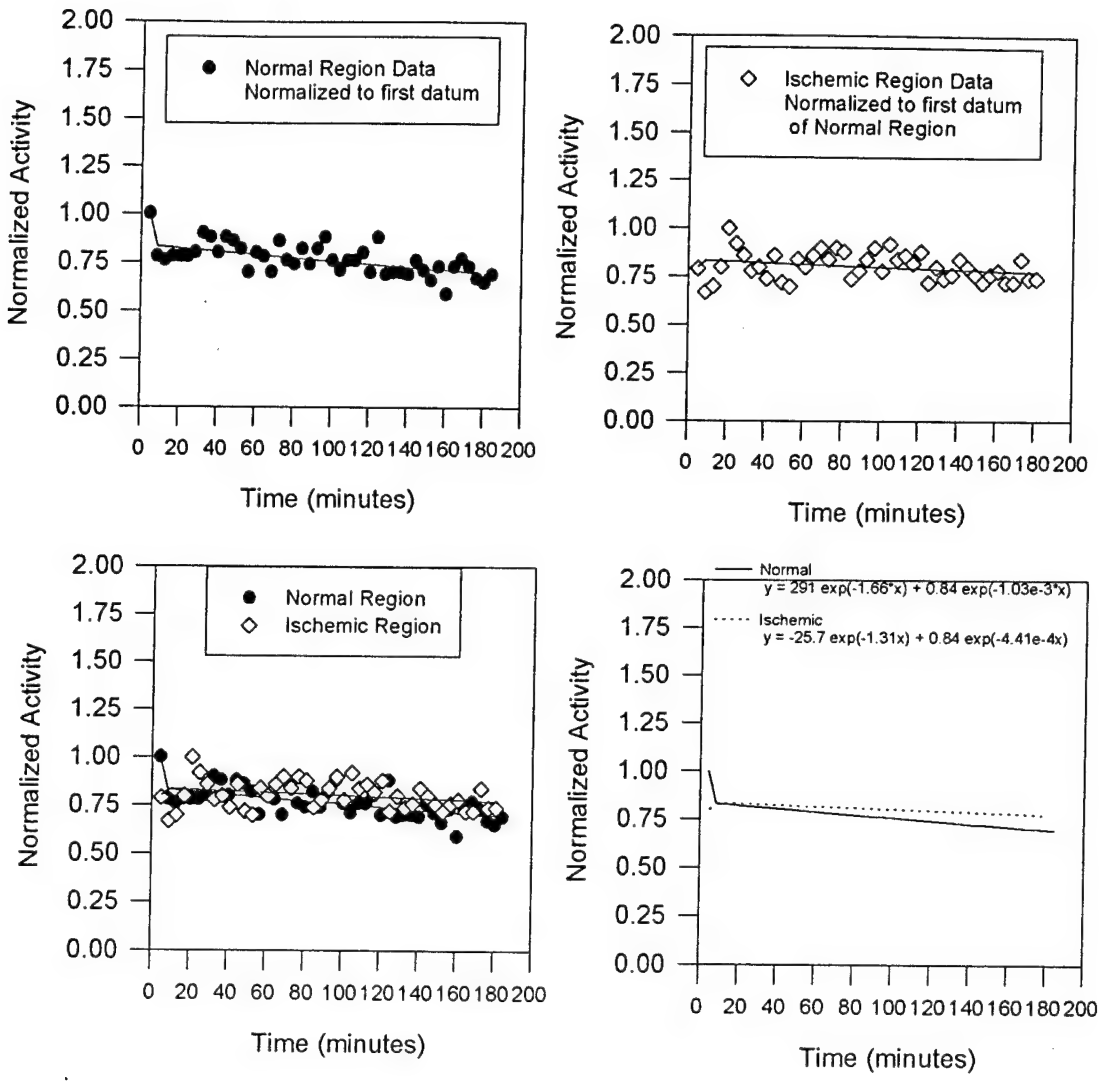

Figure 17: Above graphs are for experiment 950731. a. Normal Region Activity Clearance. b. Plot of Ischemic Region Clearance, c. Combine plot of Normal and Ishcemic d. Fit to the clearance of normal and ischemic region

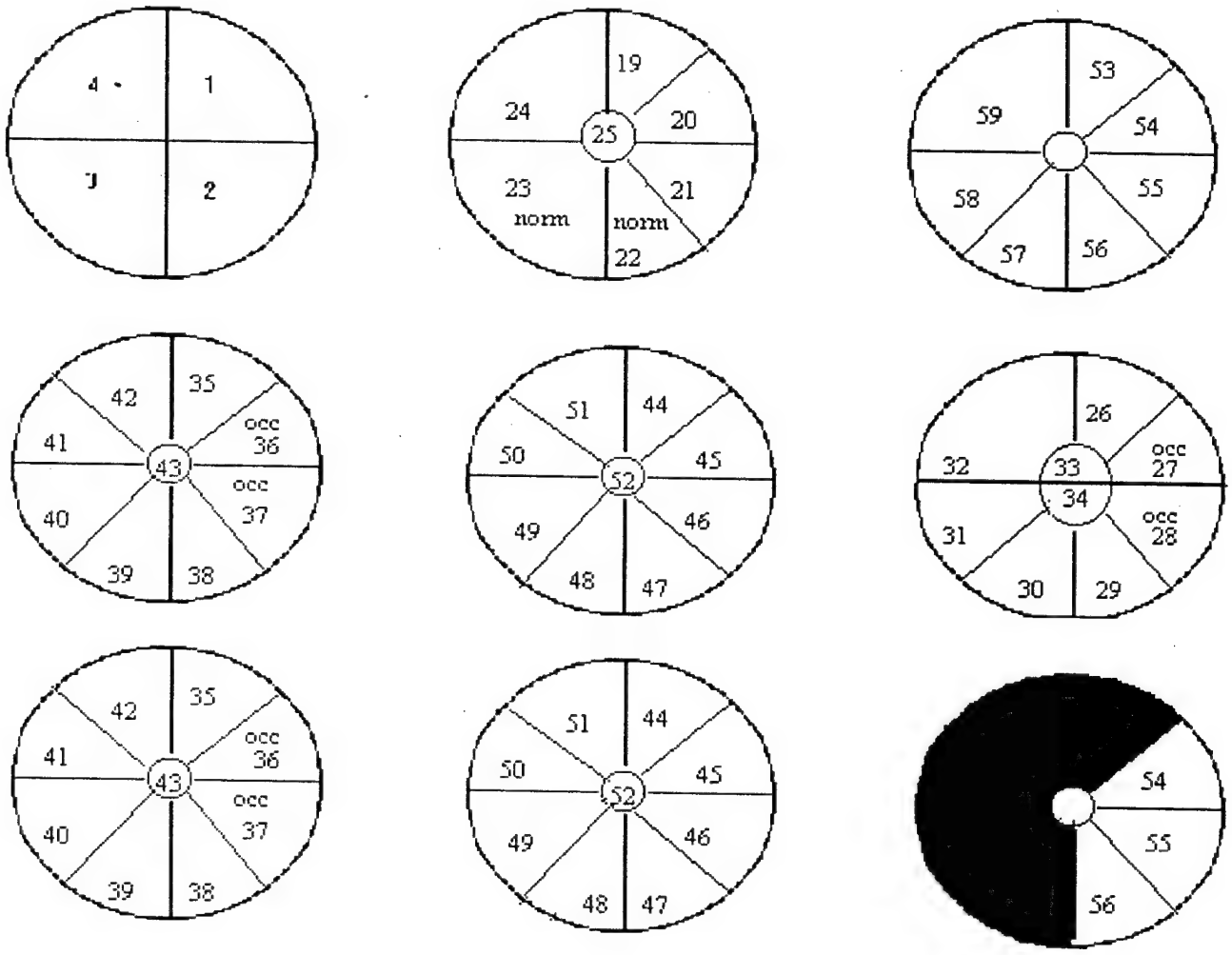

Figure 18: Dissection of the Heart for Experiment 950731. TLD placement for normal region is marked with 'norm' and TLD placement for ischemic (occluded) region is marked with 'occ'.

TABLE 17

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950731

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
1	3.2E-02	1.49E+05	6.31E+02	3.72E+01	1.16E+03	3.35E+04	0	0	2.5	2.94E+05	1.02E+03	6.00E+01	1.87E+03
2	2.9E-02	1.39E+05	6.42E+02	2.21E+02	1.24E+03	3.35E+04	0	2.8	12.5	2.78E+05	1.04E+03	3.60E+02	2.02E+03
3	3.7E-02	1.20E+05	5.03E+02	1.50E+03	1.37E+03	2.30E+04	0	5.5	1.5	2.30E+05	8.12E+02	2.42E+03	2.21E+03
4	2.1E-02	7.26E+04	5.09E+02	8.16E+02	1.04E+03	1.37E+04	0	9.4	2.5	1.39E+05	8.21E+02	1.33E+03	1.69E+03
5	4.5E-02	1.71E+05	7.23E+02	3.02E+01	1.48E+03	3.43E+04	0	2.5	0	3.31E+05	1.17E+03	5.27E+01	2.38E+03
6	3.8E-02	1.34E+05	5.66E+02	4.85E+02	1.58E+03	3.11E+04	0	0	7.5	2.67E+05	9.13E+02	7.82E+02	2.56E+03
7	1.7E-02	6.04E+04	3.05E+02	1.11E+03	9.30E+02	1.66E+04	0	9.3	4.5	1.24E+05	4.92E+02	1.81E+03	1.51E+03
8	1.0E-02	2.85E+04	1.68E+02	7.50E+01	3.29E+02	7.38E+03	0	0	0	5.79E+04	2.71E+02	1.21E+02	5.31E+02
9	4.8E-02	1.78E+05	8.07E+02	9.80E+00	1.75E+03	3.77E+04	0	0	11.6	3.48E+05	1.30E+03	1.58E+01	2.84E+03
10	4.3E-02	1.54E+05	8.75E+02	1.72E+03	2.37E+03	3.83E+04	0	0.9	11.6	3.10E+05	1.41E+03	2.78E+03	3.85E+03
11	4.8E-02	1.69E+05	1.08E+03	3.04E+03	2.38E+03	3.97E+04	0	0	8.6	3.37E+05	1.74E+03	4.90E+03	3.86E+03
12	5.2E-02	1.62E+05	9.90E+02	1.68E+03	2.16E+03	3.10E+04	0	2.4	2.5	3.11E+05	1.60E+03	2.71E+03	3.49E+03
13	1.6E-02	6.06E+04	3.58E+02	1.18E+01	9.89E+02	1.35E+04	0	1.3	4.5	1.20E+05	5.78E+02	2.11E+01	1.60E+03
14	5.6E-02	2.33E+05	1.37E+03	4.38E+01	2.62E+03	3.23E+04	0	3.2	6.5	4.28E+05	2.21E+03	7.58E+01	4.24E+03
15	4.4E-02	1.58E+05	7.73E+02	1.04E+03	2.11E+03	3.48E+04	0	0.3	3.5	3.11E+05	1.25E+03	1.67E+03	3.41E+03
16	4.2E-02	1.38E+05	9.06E+02	2.39E+03	1.96E+03	2.60E+04	0	4	9.5	2.64E+05	1.46E+03	3.87E+03	3.17E+03
17	5.1E-02	1.61E+05	9.57E+02	2.29E+03	2.14E+03	3.00E+04	0	2.2	6.5	3.08E+05	1.54E+03	3.69E+03	3.46E+03
18	1.2E-02	3.30E+04	2.43E+02	9.70E+00	5.29E+02	9.05E+03	0	1.4	1.5	6.78E+04	3.92E+02	1.79E+01	8.55E+02
19	5.0E-02	1.68E+05	1.02E+03	4.10E+00	1.76E+03	3.10E+04	0	0.5	0	3.20E+05	1.65E+03	7.42E+00	2.84E+03
20	3.7E-02	1.24E+05	7.56E+02	1.78E+01	1.48E+03	2.66E+04	0	0	13.6	2.43E+05	1.22E+03	2.87E+01	2.42E+03
21	5.3E-02	1.62E+05	9.82E+02	4.83E+02	2.39E+03	3.18E+04	0	2	9.5	3.12E+05	1.58E+03	7.83E+02	3.87E+03
22	3.2E-02	1.19E+05	5.24E+02	1.91E+03	1.36E+03	2.21E+04	0	0	6.5	2.28E+05	8.45E+02	3.08E+03	2.20E+03
23	3.4E-02	1.23E+05	6.78E+02	2.01E+03	1.46E+03	2.74E+04	0	9	9.5	2.43E+05	1.09E+03	3.26E+03	2.38E+03
24	3.4E-02	1.12E+05	5.99E+02	1.13E+03	1.50E+03	2.16E+04	0	11.4	3.5	2.16E+05	9.66E+02	1.84E+03	2.42E+03
25	1.4E-02	4.68E+04	2.33E+02	9.60E+00	1.05E+03	7.55E+03	0	0.1	6.5	8.77E+04	3.76E+02	1.56E+01	1.70E+03
26	4.4E-02	1.56E+05	1.00E+03	2.90E+01	1.77E+03	2.78E+04	0	4.3	4.5	2.96E+05	1.61E+03	5.37E+01	2.86E+03
27	4.0E-02	1.44E+05	7.96E+02	3.34E+01	1.64E+03	2.45E+04	0	3.5	0.5	2.71E+05	1.28E+03	5.95E+01	2.64E+03
28	3.3E-02	1.08E+05	6.10E+02	5.23E+02	1.52E+03	2.27E+04	0	0	8.5	2.11E+05	9.83E+02	8.44E+02	2.47E+03
29	2.1E-02	5.17E+04	2.81E+02	1.00E+03	6.93E+02	1.27E+04	0	1.4	2.5	1.04E+05	4.54E+02	1.62E+03	1.12E+03
30	2.5E-02	6.06E+04	3.48E+02	1.18E+03	8.50E+02	1.26E+04	0	0	4.5	1.18E+05	5.60E+02	1.90E+03	1.38E+03
31	3.0E-02	1.00E+05	6.47E+02	1.79E+03	1.33E+03	1.83E+04	0	8.3	4.5	1.91E+05	1.04E+03	2.89E+03	2.16E+03
32	4.6E-02	1.63E+05	1.17E+03	2.92E+03	2.79E+03	2.83E+04	0	6	9.5	3.09E+05	1.89E+03	4.72E+03	4.51E+03
33	2.6E-02	8.64E+04	4.11E+02	7.80E+00	1.45E+03	1.13E+04	0	0	13.6	1.58E+05	6.63E+02	1.26E+01	2.36E+03
34	2.1E-02	6.20E+04	4.19E+02	3.19E+02	9.45E+02	1.03E+04	0	8.2	6.5	1.17E+05	6.76E+02	5.27E+02	1.53E+03
35	3.1E-02	1.15E+05	6.30E+02	9.90E+00	1.07E+03	1.93E+04	0	0	0	2.17E+05	1.02E+03	1.60E+01	1.73E+03
36	2.1E-02	9.39E+04	5.26E+02	8.50E+00	1.14E+03	1.74E+04	0	1.2	6.5	1.80E+05	8.48E+02	1.56E+01	1.84E+03

TABLE 17-CONTINUED

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950731

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath Activity in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
37	3.3E-02	1.17E+05	4.84E+02	2.83E+02	1.29E+03	2.31E+04	0	0	9.6	2.26E+05	7.80E+02	4.56E+02	2.09E+03
38	3.1E-02	1.03E+05	5.53E+02	1.69E+03	1.38E+03	2.07E+04	0	0.3	3.5	1.99E+05	8.92E+02	2.73E+03	2.23E+03
39	3.9E-02	1.87E+05	9.15E+02	2.49E+03	1.88E+03	2.84E+04	0	2.1	8.5	3.47E+05	1.48E+03	4.02E+03	3.05E+03
40	3.0E-02	1.00E+05	5.74E+02	1.70E+03	1.14E+03	1.90E+04	0	2.5	0	1.93E+05	9.25E+02	2.74E+03	1.84E+03
41	2.3E-02	1.01E+05	5.45E+02	1.66E+03	1.15E+03	1.62E+04	0	9.5	1.5	1.89E+05	8.80E+02	2.70E+03	1.85E+03
42	3.4E-02	1.09E+05	8.17E+02	1.09E+03	1.61E+03	1.59E+04	0	8.4	2.5	2.02E+05	1.32E+03	1.77E+03	2.59E+03
43	1.1E-02	5.81E+04	3.55E+02	8.40E+02	7.96E+02	8.92E+03	0	0	12.6	1.08E+05	5.72E+02	1.35E+03	1.30E+03
44	4.7E-02	2.15E+05	1.35E+03	1.94E+03	2.30E+03	2.57E+04	0	0.4	2.5	3.89E+05	2.17E+03	3.13E+03	3.71E+03
45	4.4E-02	1.58E+05	8.11E+02	2.30E+01	1.43E+03	2.63E+04	0	0	3.5	2.98E+05	1.31E+03	3.71E+01	2.31E+03
46	4.0E-02	1.50E+05	7.05E+02	4.07E+02	1.42E+03	2.45E+04	0	5	9.5	2.81E+05	1.14E+03	6.65E+02	2.31E+03
47	4.1E-02	1.84E+05	7.52E+02	2.34E+03	1.66E+03	2.27E+04	0	4.2	6.5	3.33E+05	1.21E+03	3.78E+03	2.68E+03
48	4.8E-02	1.52E+05	7.94E+02	2.59E+03	2.16E+03	2.33E+04	0	1.1	7.5	2.82E+05	1.28E+03	4.18E+03	3.50E+03
49	3.3E-02	1.09E+05	6.90E+02	1.85E+03	1.43E+03	1.62E+04	0	0	1.5	2.02E+05	1.11E+03	2.98E+03	2.31E+03
50	3.1E-02	9.20E+04	5.27E+02	1.55E+03	1.17E+03	1.60E+04	0	6.5	1.5	1.74E+05	8.50E+02	2.51E+03	1.89E+03
51	3.7E-02	1.35E+05	8.92E+02	2.49E+03	1.86E+03	2.00E+04	0	7.1	8.5	2.50E+05	1.44E+03	4.02E+03	3.02E+03
52	1.1E-02	4.63E+04	1.26E+02	5.09E+02	4.12E+02	6.00E+03	0	1.4	1.5	8.43E+04	2.02E+02	8.24E+02	6.66E+02
53	3.8E-02	2.25E+05	5.82E+02	2.11E+03	1.41E+03	2.36E+04	0	4.5	0	4.01E+05	9.39E+02	3.41E+03	2.27E+03
54	3.6E-02	1.34E+05	7.11E+02	1.00E+03	1.41E+03	1.83E+04	0	0	3.5	2.46E+05	1.15E+03	1.61E+03	2.29E+03
55	3.7E-02	1.38E+05	5.04E+02	2.59E+02	1.01E+03	1.98E+04	0	0	0	2.54E+05	8.13E+02	4.18E+02	1.63E+03
56	4.1E-02	2.57E+05	7.23E+02	2.38E+03	1.87E+03	2.85E+04	0	4.5	1.5	4.60E+05	1.17E+03	3.85E+03	3.02E+03
57	2.3E-02	1.02E+05	6.29E+02	1.91E+03	1.58E+03	1.66E+04	0	0.1	7.5	1.91E+05	1.01E+03	3.07E+03	2.56E+03
58	2.8E-02	1.29E+05	6.01E+02	1.81E+03	1.61E+03	2.00E+04	0	13.5	1.5	2.40E+05	9.69E+02	2.94E+03	2.60E+03
59	5.7E-02	1.91E+05	1.07E+03	3.23E+03	2.44E+03	3.99E+04	0	2.5	0	3.73E+05	1.73E+03	5.22E+03	3.93E+03
60	5.4E-02	3.64E+05	8.48E+02	2.42E+03	1.94E+03	4.22E+04	0	1.4	2.5	6.56E+05	1.37E+03	3.91E+03	3.14E+03
61	4.7E-02	3.27E+05	6.92E+02	2.65E+03	1.92E+03	3.60E+04	0	13.9	11.5	5.85E+05	1.12E+03	4.30E+03	3.12E+03
62	5.8E-02	2.03E+05	9.90E+02	2.97E+03	2.71E+03	3.50E+04	0	2.5	1.5	3.84E+05	1.60E+03	4.80E+03	4.37E+03
Totals	2.19E+00									1.59E+07	6.82E+04	1.20E+05	1.54E+05

TABLE 18

REFERENCE BLOOD ACTIVITY

(Experiment 950731)

Microshpere Blood Counts		
Cr-51	Ru-103	Nb-95
2.68E+03	4.83E+03	3.83E+03
2.87E+03	4.96E+03	4.02E+03
2.97E+03	4.95E+03	3.93E+03
2.74E+03	5.29E+03	4.10E+03
2.82E+03	5.27E+03	4.02E+03
2.98E+03	5.00E+03	4.25E+03
2.91E+03	5.23E+03	4.09E+03
2.87E+03	4.92E+03	3.90E+03
2.75E+03	4.51E+03	4.02E+03
2.24E+03	5.03E+03	3.35E+03
2.56E+03	4.45E+03	3.71E+03
2.59E+03	4.87E+03	3.82E+03
2.59E+03	4.61E+03	3.76E+03
2.54E+03	4.66E+03	3.60E+03
1.26E+03	2.88E+03	3.26E+03
4.65E+03	6.97E+03	1.04E+04
3.63E+02	3.45E+02	1.09E+02
Totals: 4.44E+04	7.88E+04	6.81E+04
Activity(dpm): 7.16E+04	1.27E+05	1.10E+05
Volumes(ml): **6.20E+00**	**5.20E+00**	**6.10E+00**

TABLE 19

ABSOLUTE FLOWS AND TC-99m DISTRIBUTION IN MYOCARDIUM

(Experiment 950731)

Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95	Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51	Ru-103	Nb-95
1	8.09E-03	9.18E-01	2.56E-02	1.08E+00	**36**	7.53E-03	1.17E+00	1.02E-02	1.62E+00
2	8.44E-03	1.03E+00	1.69E-01	1.29E+00	**37**	6.02E-03	6.83E-01	1.88E-01	1.17E+00
3	5.49E-03	6.33E-01	8.92E-01	1.10E+00	**38**	5.65E-03	8.31E-01	1.20E+00	1.33E+00
4	5.84E-03	1.13E+00	8.65E-01	1.49E+00	**39**	9.55E-03	1.33E+00	1.71E+00	1.76E+00
5	6.48E-03	7.49E-01	1.60E-02	9.80E-01	**40**	5.85E-03	9.21E-01	1.29E+00	1.17E+00
6	6.18E-03	6.94E-01	2.81E-01	1.25E+00	**41**	4.49E-03	6.86E-01	9.94E-01	9.28E-01
7	6.43E-03	8.36E-01	1.45E+00	1.64E+00	**42**	8.45E-03	1.81E+00	1.15E+00	2.29E+00
8	5.10E-03	7.83E-01	1.65E-01	9.83E-01	**43**	2.12E-03	3.67E-01	4.11E-01	5.36E-01
9	6.39E-03	7.83E-01	4.49E-03	1.10E+00	**44**	9.01E-03	1.65E+00	1.12E+00	1.81E+00
10	6.35E-03	9.48E-01	8.83E-01	1.66E+00	**45**	1.54E-02	2.22E+00	2.98E-02	2.51E+00
11	6.19E-03	1.05E+00	1.39E+00	1.49E+00	**46**	2.48E-02	3.28E+00	9.07E-01	4.27E+00
12	5.27E-03	8.86E-01	7.11E-01	1.24E+00	**47**	6.10E-03	7.29E-01	1.07E+00	1.04E+00
13	6.58E-03	1.04E+00	1.80E-02	1.85E+00	**48**	5.78E-03	8.60E-01	1.32E+00	1.51E+00
14	6.73E-03	1.14E+00	1.85E-02	1.40E+00	**49**	3.70E-03	6.69E-01	8.47E-01	8.91E-01
15	6.24E-03	8.18E-01	5.18E-01	1.44E+00	**50**	2.95E-03	4.72E-01	6.60E-01	6.71E-01
16	5.53E-03	1.00E+00	1.26E+00	1.40E+00	**51**	1.38E-02	2.60E+00	3.43E+00	3.49E+00
17	5.32E-03	8.74E-01	9.88E-01	1.26E+00	**52**	1.33E-03	1.04E-01	2.01E-01	2.20E-01
18	4.98E-03	9.42E-01	2.04E-02	1.32E+00	**53**	8.03E-03	6.16E-01	1.06E+00	9.54E-01
19	5.65E-03	9.54E-01	2.02E-03	1.05E+00	**54**	5.15E-03	7.88E-01	5.24E-01	1.01E+00
20	5.79E-03	9.51E-01	1.06E-02	1.21E+00	**55**	4.39E-03	4.61E-01	1.12E-01	5.92E-01
21	5.19E-03	8.63E-01	2.02E-01	1.35E+00	**56**	3.38E-02	2.81E+00	4.38E+00	4.65E+00
22	6.27E-03	7.62E-01	1.31E+00	1.27E+00	**57**	3.36E-03	5.85E-01	8.38E-01	9.46E-01
23	6.30E-03	9.29E-01	1.31E+00	1.29E+00	**58**	5.71E-03	7.56E-01	1.09E+00	1.30E+00
24	5.59E-03	8.20E-01	7.36E-01	1.32E+00	**59**	6.20E-03	9.44E-01	1.34E+00	1.37E+00
25	5.52E-03	7.75E-01	1.52E-02	2.25E+00	**60**	1.81E-02	1.23E+00	1.67E+00	1.82E+00
26	5.93E-03	1.06E+00	1.67E-02	1.20E+00	**61**	1.52E-02	9.48E-01	1.72E+00	1.70E+00
27	5.97E-03	9.27E-01	2.03E-02	1.22E+00	**62**	9.94E-03	1.36E+00	1.92E+00	2.38E+00
28	5.63E-03	8.60E-01	3.49E-01	1.38E+00	**63**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
29	4.36E-03	6.24E-01	1.05E+00	9.88E-01	**64**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
30	4.16E-03	6.47E-01	1.03E+00	1.02E+00	**65**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31	5.61E-03	1.00E+00	1.32E+00	1.33E+00	**66**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	5.92E-03	1.19E+00	1.40E+00	1.82E+00	**67**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	5.34E-03	7.36E-01	6.60E-03	1.68E+00	**68**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
34	4.90E-03	9.29E-01	3.43E-01	1.35E+00	**69**	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35	6.16E-03	9.47E-01	7.03E-03	1.03E+00					

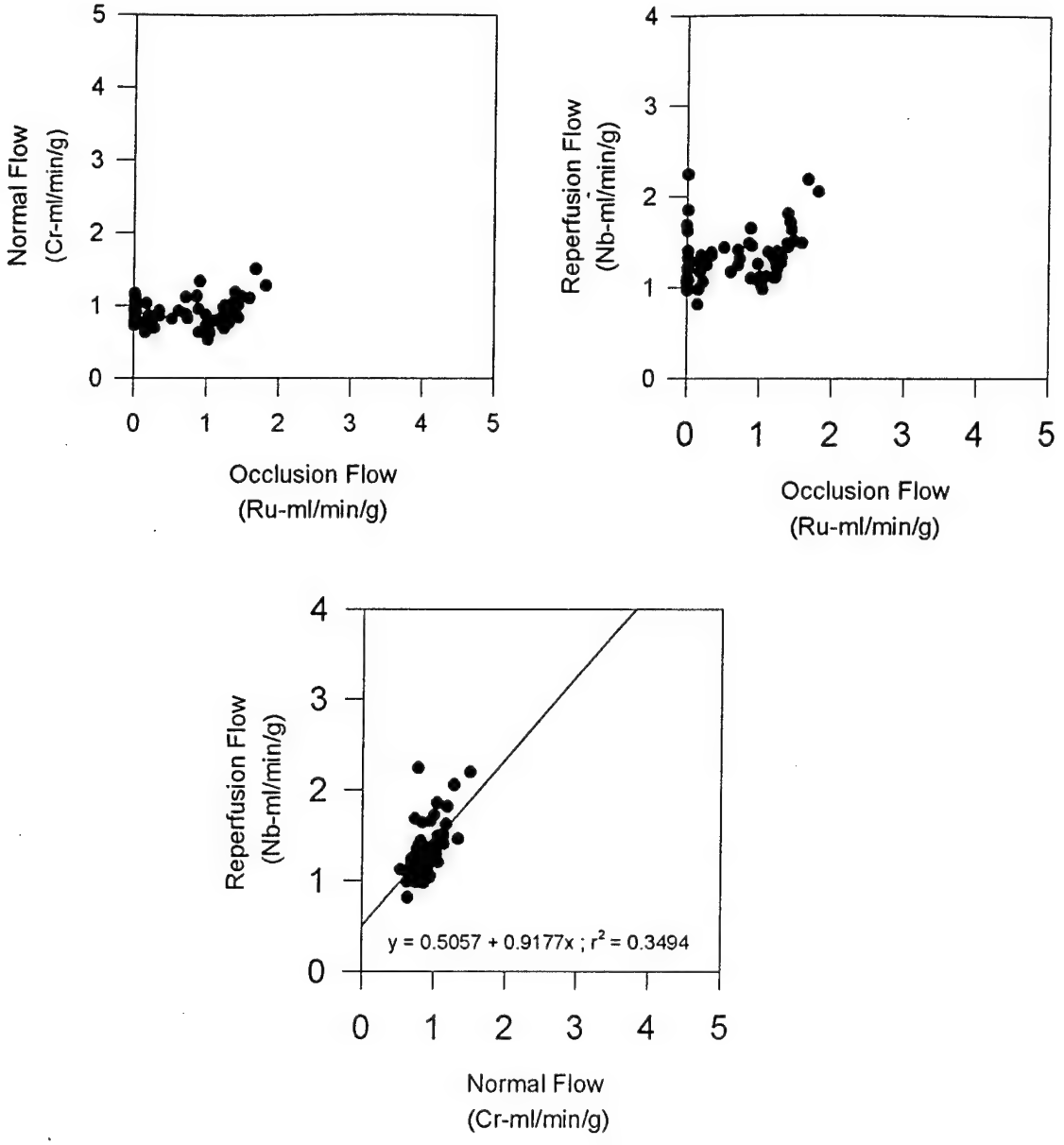

Figure 19: Above graphs are the reference blood comparisons flows for Experiment 950731. a. Plot of normal reference blood flow vs occlusion flow, b. Plot of reperfusion flow vs occlusion flow, c. Plot of reperfusion flow vs normal flow.

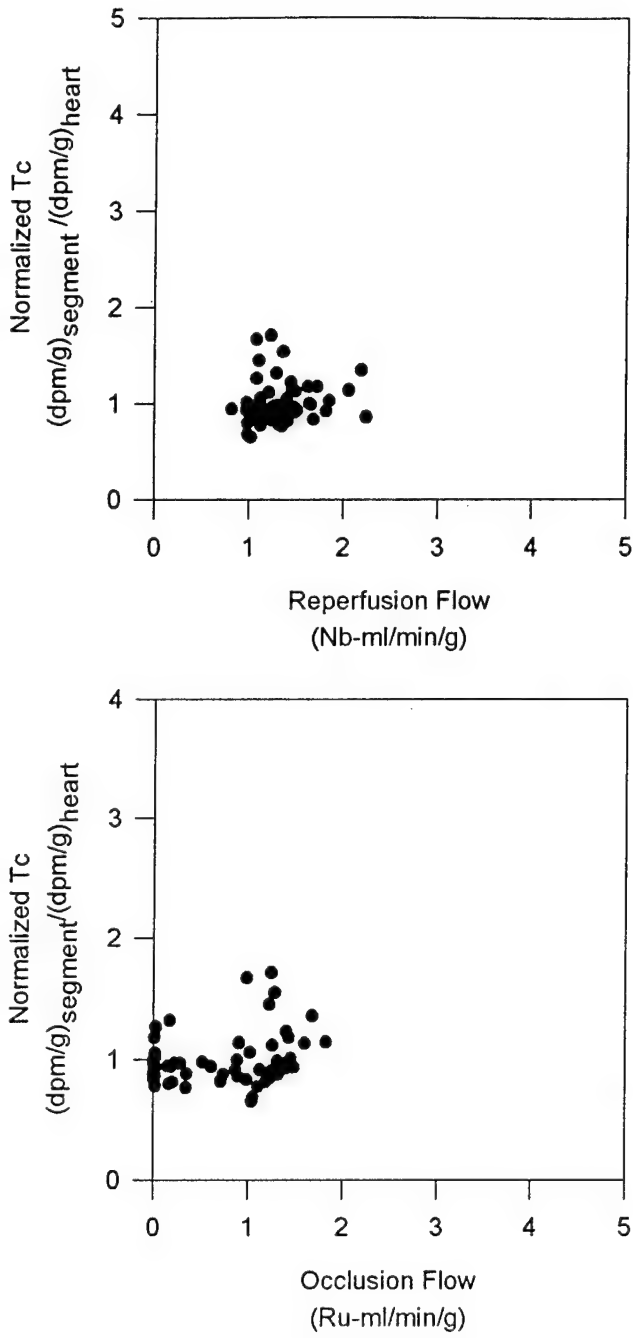

Figure 20: Above graphs are comparisons of Tc-99m distribution in each heart segment to the reference blood flows in the segment for Experiment 950731. a. Plot of normalized Tc vs reperfusion flow b. Plot of normalized Tc vs occlusion flow

Appendix 4

Data Tables and Illustrations for Experiment 950906

TABLE 20

BLOOD CLEARANCE FOR EXPERIMENT 950906.

Sample	Lapse Time	Measurement	Corrected (a)	Tube-Blood	Tube Mass	Blood Mass	Calculated	Fit Data
#	HH:MM:SS	CPM	DPM	Mass in g	g	g	dpm/mg	dpm/mg
1	0:04:30	**6.78E+05**	2.76E+07	**3.15E+00**	**2.68E+00**	4.72E-01	5.85E+04	5.85E+04
2	0:05:00	**1.15E+05**	4.68E+06	**3.14E+00**	**2.71E+00**	4.23E-01	1.11E+04	1.75E+04
3	0:06:00	**1.92E+05**	7.78E+06	**3.09E+00**	**2.70E+00**	3.91E-01	1.99E+04	1.75E+04
4	0:07:00	**1.74E+05**	7.03E+06	**3.12E+00**	**2.73E+00**	3.93E-01	1.79E+04	1.74E+04
5	0:08:00	**1.44E+05**	5.83E+06	**3.06E+00**	**2.71E+00**	3.48E-01	1.67E+04	1.74E+04
6	0:09:00	**1.37E+05**	5.52E+06	**3.00E+00**	**2.69E+00**	3.17E-01	1.74E+04	1.73E+04
7	0:10:00	**1.66E+05**	6.67E+06	**3.08E+00**	**2.70E+00**	3.79E-01	1.76E+04	1.73E+04
8	0:11:00	**1.62E+05**	6.50E+06	**3.05E+00**	**2.69E+00**	3.59E-01	1.81E+04	1.72E+04
9	0:12:00	**1.61E+05**	6.46E+06	**3.05E+00**	**2.70E+00**	3.55E-01	1.82E+04	1.72E+04
10	0:13:00	**1.73E+05**	6.95E+06	**3.11E+00**	**2.73E+00**	3.75E-01	1.85E+04	1.71E+04
11	0:14:00	**1.65E+05**	6.60E+06	**3.05E+00**	**2.69E+00**	3.66E-01	1.80E+04	1.71E+04
12	0:19:00	**2.16E+05**	8.54E+06	**3.17E+00**	**2.70E+00**	4.70E-01	1.82E+04	1.68E+04
13	0:24:00	**1.62E+05**	6.36E+06	**3.05E+00**	**2.69E+00**	3.69E-01	1.72E+04	1.66E+04
14	0:29:00	**1.50E+05**	5.83E+06	**3.04E+00**	**2.69E+00**	3.52E-01	1.66E+04	1.64E+04
15	0:34:00	**1.66E+05**	6.37E+06	**3.13E+00**	**2.72E+00**	4.08E-01	1.56E+04	1.62E+04
16	0:49:00	**1.49E+05**	5.57E+06	**3.11E+00**	**2.71E+00**	4.03E-01	1.38E+04	1.55E+04
17	1:04:00	**1.39E+05**	5.04E+06	**3.03E+00**	**2.68E+00**	3.54E-01	1.42E+04	1.49E+04
18	1:19:00	**1.73E+05**	6.12E+06	**3.20E+00**	**2.77E+00**	4.35E-01	1.41E+04	1.43E+04
19	1:34:00	**1.73E+05**	5.92E+06	**3.13E+00**	**2.70E+00**	4.30E-01	1.38E+04	1.37E+04
20	1:49:00	**1.85E+05**	6.17E+06	**3.20E+00**	**2.73E+00**	4.72E-01	1.31E+04	1.31E+04
21	2:04:00	**1.63E+05**	5.28E+06	**3.11E+00**	**2.68E+00**	4.29E-01	1.23E+04	1.26E+04
22	2:19:00	**1.51E+05**	4.76E+06	**3.11E+00**	**2.71E+00**	3.95E-01	1.20E+04	1.21E+04
23	2:34:00	**1.84E+05**	5.61E+06	**3.17E+00**	**2.67E+00**	4.98E-01	1.13E+04	1.16E+04
24	2:49:00	**1.62E+05**	4.79E+06	**3.10E+00**	**2.70E+00**	4.03E-01	1.19E+04	1.11E+04
25	3:04:00	**1.65E+05**	4.76E+06	**3.20E+00**	**2.77E+00**	4.35E-01	1.09E+04	1.07E+04

Note: The blood specific activity (dpm/mg) is plotted against time in figure 20.

(a) 99m Tc Half-life (hrs) 6.01
Collection to Counting Time (hrs) **28.00**
Detector Efficiency (Counts/Decay) 0.62

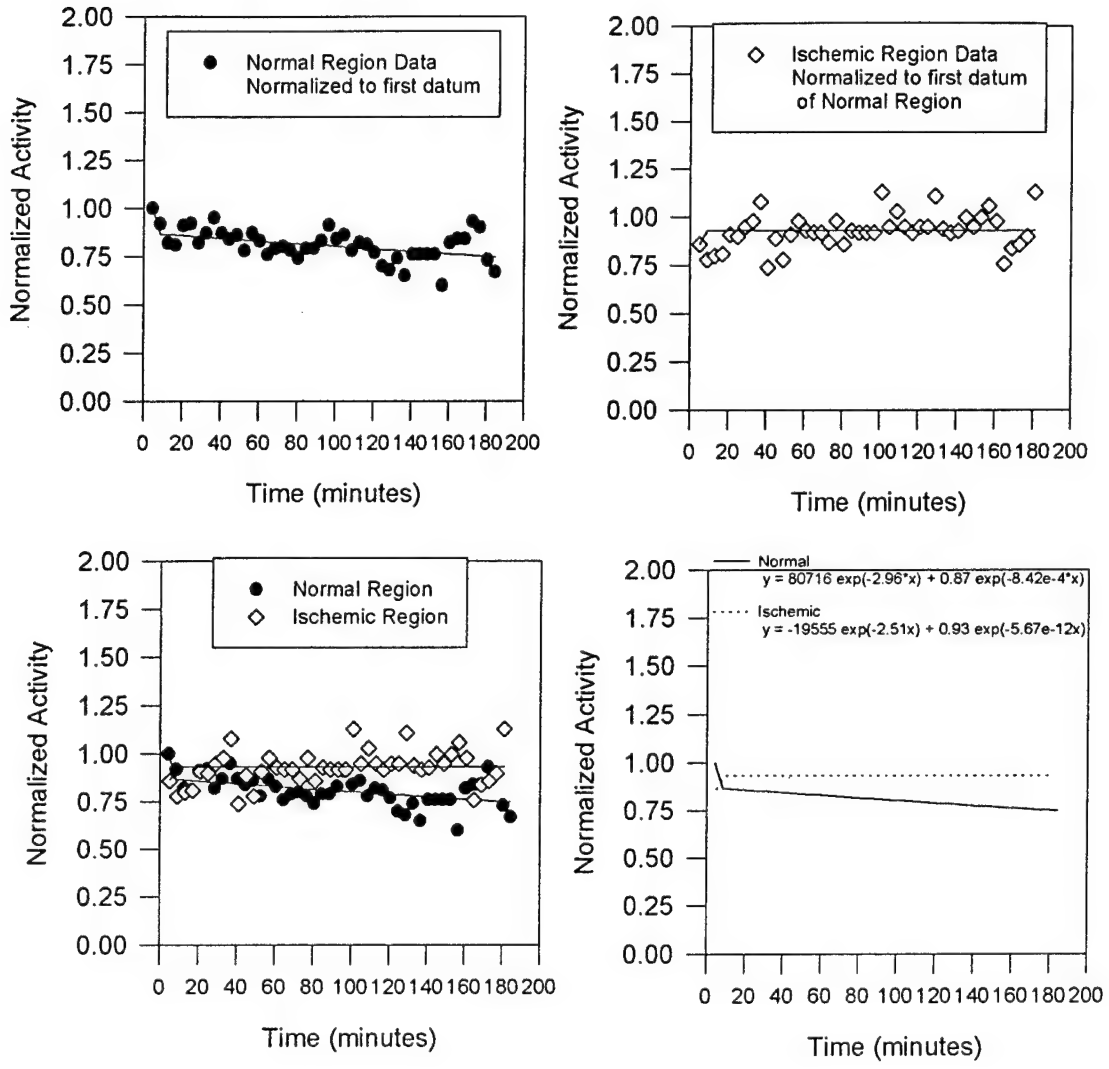

Figure 22: Above graphs are for experiment 950906. a. Normal Region Activity Clearance. b. Plot of Ischemic Region Clearance, c. Combine plot of Normal and Ishcemic d. Fit to the clearance of normal and ischemic region

TABLE 22

TLD DATA OF THE ISCHEMIC REGION FOR EXPERIMENT 950906.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a)	
						uCi	Normalized
2	0:05:00	**3.50E+04**	1.61E+01	9.90E+00	3.90E-01	1.57E+01	8.58E-01
4	0:09:00	**3.18E+04**	1.46E+01	9.79E+00	3.86E-01	1.42E+01	7.75E-01
6	0:13:00	**3.29E+04**	1.51E+01	9.68E+00	3.82E-01	1.48E+01	8.04E-01
8	0:17:00	**3.28E+04**	1.51E+01	9.57E+00	1.54E-01	1.49E+01	8.14E-01
10	0:21:00	**3.65E+04**	1.69E+01	9.47E+00	1.52E-01	1.67E+01	9.10E-01
12	0:25:00	**3.60E+04**	1.66E+01	9.36E+00	1.51E-01	1.65E+01	8.97E-01
14	0:29:00	**3.80E+04**	1.76E+01	9.26E+00	1.49E-01	1.74E+01	9.49E-01
16	0:33:00	**3.90E+04**	1.80E+01	9.16E+00	1.47E-01	1.79E+01	9.75E-01
18	0:37:00	**4.30E+04**	2.00E+01	9.06E+00	1.46E-01	1.98E+01	1.08E+00
20	0:41:00	**3.01E+04**	1.38E+01	8.96E+00	1.44E-01	1.37E+01	7.44E-01
22	0:45:00	**3.59E+04**	1.66E+01	8.86E+00	1.43E-01	1.64E+01	8.95E-01
24	0:49:00	**3.16E+04**	1.45E+01	8.76E+00	1.41E-01	1.44E+01	7.83E-01
26	0:53:00	**3.65E+04**	1.69E+01	8.66E+00	1.39E-01	1.67E+01	9.11E-01
28	0:57:00	**3.90E+04**	1.80E+01	8.57E+00	1.38E-01	1.79E+01	9.76E-01
30	1:01:00	**3.72E+04**	1.72E+01	8.47E+00	1.36E-01	1.70E+01	9.29E-01
32	1:05:00	**3.70E+04**	1.71E+01	8.38E+00	1.35E-01	1.70E+01	9.24E-01
34	1:09:00	**3.70E+04**	1.71E+01	8.29E+00	1.33E-01	1.70E+01	9.24E-01
36	1:13:00	**3.48E+04**	1.60E+01	8.19E+00	1.32E-01	1.59E+01	8.67E-01
38	1:17:00	**3.90E+04**	1.80E+01	8.10E+00	1.30E-01	1.79E+01	9.76E-01
40	1:21:00	**3.44E+04**	1.59E+01	8.02E+00	1.29E-01	1.57E+01	8.57E-01
42	1:25:00	**3.71E+04**	1.71E+01	7.93E+00	1.28E-01	1.70E+01	9.27E-01
44	1:29:00	**3.70E+04**	1.71E+01	7.84E+00	1.26E-01	1.70E+01	9.24E-01
46	1:33:00	**3.69E+04**	1.70E+01	7.75E+00	1.25E-01	1.69E+01	9.22E-01
48	1:37:00	**3.68E+04**	1.70E+01	7.67E+00	1.23E-01	1.69E+01	9.19E-01
50	1:41:00	**4.50E+04**	2.09E+01	7.58E+00	1.22E-01	2.08E+01	1.13E+00
52	1:45:00	**3.80E+04**	1.76E+01	7.50E+00	1.21E-01	1.74E+01	9.51E-01
54	1:49:00	**4.10E+04**	1.90E+01	7.42E+00	1.19E-01	1.89E+01	1.03E+00
56	1:53:00	**3.80E+04**	1.76E+01	7.33E+00	1.18E-01	1.74E+01	9.51E-01
58	1:57:00	**3.68E+04**	1.70E+01	7.25E+00	1.17E-01	1.69E+01	9.20E-01
60	2:01:00	**3.78E+04**	1.75E+01	7.17E+00	1.15E-01	1.74E+01	9.46E-01
62	2:05:00	**3.80E+04**	1.76E+01	7.09E+00	1.14E-01	1.75E+01	9.51E-01
64	2:09:00	**4.40E+04**	2.04E+01	7.02E+00	1.13E-01	2.03E+01	1.11E+00
66	2:13:00	**3.74E+04**	1.73E+01	6.94E+00	1.12E-01	1.72E+01	9.36E-01
68	2:17:00	**3.67E+04**	1.69E+01	6.86E+00	1.10E-01	1.68E+01	9.18E-01
70	2:21:00	**3.70E+04**	1.71E+01	6.79E+00	1.09E-01	1.70E+01	9.25E-01
72	2:25:00	**4.00E+04**	1.85E+01	6.71E+00	1.08E-01	1.84E+01	1.00E+00
74	2:29:00	**3.80E+04**	1.76E+01	6.64E+00	1.07E-01	1.75E+01	9.52E-01
76	2:33:00	**4.00E+04**	1.85E+01	6.56E+00	1.06E-01	1.84E+01	1.00E+00
78	2:37:00	**4.20E+04**	1.95E+01	6.49E+00	1.04E-01	1.94E+01	1.06E+00
80	2:41:00	**3.90E+04**	1.80E+01	6.42E+00	1.03E-01	1.79E+01	9.78E-01
82	2:45:00	**3.05E+04**	1.40E+01	6.35E+00	1.02E-01	1.39E+01	7.57E-01
84	2:49:00	**3.36E+04**	1.55E+01	6.28E+00	1.01E-01	1.54E+01	8.37E-01
86	2:53:00	**3.43E+04**	1.58E+01	6.21E+00	1.00E-01	1.57E+01	8.56E-01
88	2:57:00	**3.61E+04**	1.67E+01	6.14E+00	9.89E-02	1.66E+01	9.03E-01
90	3:01:00	**4.50E+04**	2.09E+01	6.07E+00	9.78E-02	2.08E+01	1.13E+00
92	3:05:00	**3.70E+04**	1.71E+01	6.01E+00	9.67E-02	1.70E+01	9.26E-01

Note: Figure 21 shows the plot of this data.

(a) Normalization is to first datum of normal region (Table 21).

TABLE 21

TLD DATA OF THE NORMAL REGION FOR EXPERIMENT 950906.

(This table shows the raw output of the TLDs placed on the ischemic myocardium and the calculated activity.)

TLD #	Lapse Time HH:MM:SS	Relative Light Output	Measured Activity	ALV uCi	Contributing ALV uCi	Myocardial Activity (a)	
						uCi	Normalized
1	0:04:30	**4.00E+04**	1.85E+01	1.07E+01	1.73E-01	1.83E+01	1.00E+00
3	0:08:30	**3.70E+04**	1.71E+01	9.80E+00	1.58E-01	1.69E+01	9.23E-01
5	0:12:30	**3.30E+04**	1.52E+01	9.69E+00	1.56E-01	1.50E+01	8.19E-01
7	0:16:30	**3.28E+04**	1.51E+01	9.59E+00	1.54E-01	1.49E+01	8.14E-01
9	0:20:30	**3.66E+04**	1.69E+01	9.48E+00	1.53E-01	1.67E+01	9.13E-01
11	0:24:30	**3.70E+04**	1.71E+01	9.38E+00	1.51E-01	1.69E+01	9.23E-01
13	0:28:30	**3.32E+04**	1.53E+01	9.27E+00	1.49E-01	1.51E+01	8.24E-01
15	0:32:30	**3.51E+04**	1.62E+01	9.17E+00	1.48E-01	1.60E+01	8.74E-01
17	0:36:30	**3.80E+04**	1.76E+01	9.07E+00	1.46E-01	1.74E+01	9.49E-01
19	0:40:30	**3.49E+04**	1.61E+01	8.97E+00	1.44E-01	1.59E+01	8.69E-01
21	0:44:30	**3.39E+04**	1.56E+01	8.87E+00	1.43E-01	1.55E+01	8.43E-01
23	0:48:30	**3.45E+04**	1.59E+01	8.77E+00	1.41E-01	1.58E+01	8.59E-01
25	0:52:30	**3.13E+04**	1.44E+01	8.67E+00	1.40E-01	1.42E+01	7.76E-01
27	0:56:30	**3.51E+04**	1.62E+01	8.58E+00	1.38E-01	1.60E+01	8.74E-01
29	1:00:30	**3.35E+04**	1.54E+01	8.48E+00	1.37E-01	1.53E+01	8.33E-01
31	1:04:30	**3.07E+04**	1.41E+01	8.39E+00	1.35E-01	1.39E+01	7.60E-01
33	1:08:30	**3.19E+04**	1.47E+01	8.30E+00	1.34E-01	1.45E+01	7.92E-01
35	1:12:30	**3.22E+04**	1.48E+01	8.21E+00	1.32E-01	1.47E+01	7.99E-01
37	1:16:30	**3.14E+04**	1.44E+01	8.12E+00	1.31E-01	1.43E+01	7.79E-01
39	1:20:30	**3.00E+04**	1.38E+01	8.03E+00	1.29E-01	1.36E+01	7.42E-01
41	1:24:30	**3.17E+04**	1.46E+01	7.94E+00	1.28E-01	1.44E+01	7.87E-01
43	1:28:30	**3.18E+04**	1.46E+01	7.85E+00	1.26E-01	1.45E+01	7.89E-01
45	1:32:30	**3.33E+04**	1.53E+01	7.76E+00	1.25E-01	1.52E+01	8.28E-01
47	1:36:30	**3.64E+04**	1.68E+01	7.68E+00	1.24E-01	1.67E+01	9.09E-01
49	1:40:30	**3.39E+04**	1.56E+01	7.59E+00	1.22E-01	1.55E+01	8.44E-01
51	1:44:30	**3.45E+04**	1.59E+01	7.51E+00	1.21E-01	1.58E+01	8.60E-01
53	1:48:30	**3.13E+04**	1.44E+01	7.43E+00	1.20E-01	1.43E+01	7.77E-01
55	1:52:30	**3.31E+04**	1.52E+01	7.34E+00	1.18E-01	1.51E+01	8.24E-01
57	1:56:30	**3.25E+04**	1.49E+01	7.26E+00	1.17E-01	1.48E+01	8.08E-01
59	2:00:30	**3.09E+04**	1.42E+01	7.18E+00	1.16E-01	1.41E+01	7.66E-01
61	2:04:30	**2.83E+04**	1.29E+01	7.10E+00	1.14E-01	1.28E+01	6.99E-01
63	2:08:30	**2.77E+04**	1.27E+01	7.02E+00	1.13E-01	1.25E+01	6.83E-01
65	2:12:30	**2.99E+04**	1.37E+01	6.95E+00	1.12E-01	1.36E+01	7.41E-01
67	2:16:30	**2.64E+04**	1.20E+01	6.87E+00	1.11E-01	1.19E+01	6.50E-01
69	2:20:30	**3.06E+04**	1.40E+01	6.79E+00	1.09E-01	1.39E+01	7.59E-01
71	2:24:30	**3.06E+04**	1.40E+01	6.72E+00	1.08E-01	1.39E+01	7.59E-01
73	2:28:30	**3.07E+04**	1.41E+01	6.65E+00	1.07E-01	1.40E+01	7.62E-01
75	2:32:30	**3.06E+04**	1.40E+01	6.57E+00	1.06E-01	1.39E+01	7.59E-01
77	2:36:30	**2.43E+04**	1.10E+01	6.50E+00	1.05E-01	1.09E+01	5.95E-01
79	2:40:30	**3.30E+04**	1.52E+01	6.43E+00	1.03E-01	1.51E+01	8.22E-01
81	2:44:30	**3.38E+04**	1.56E+01	6.36E+00	1.02E-01	1.55E+01	8.43E-01
83	2:48:30	**3.36E+04**	1.55E+01	6.29E+00	1.01E-01	1.54E+01	8.37E-01
85	2:52:30	**3.72E+04**	1.72E+01	6.22E+00	1.00E-01	1.71E+01	9.31E-01
87	2:56:30	**3.61E+04**	1.67E+01	6.15E+00	9.90E-02	1.66E+01	9.03E-01
89	3:00:30	**2.94E+04**	1.35E+01	6.08E+00	9.79E-02	1.34E+01	7.28E-01
91	3:04:30	**2.71E+04**	1.24E+01	6.01E+00	9.68E-02	1.23E+01	6.69E-01

Note: Figure 21 shows the plot of this data.

(a) Normalization is to first datum of normal region.

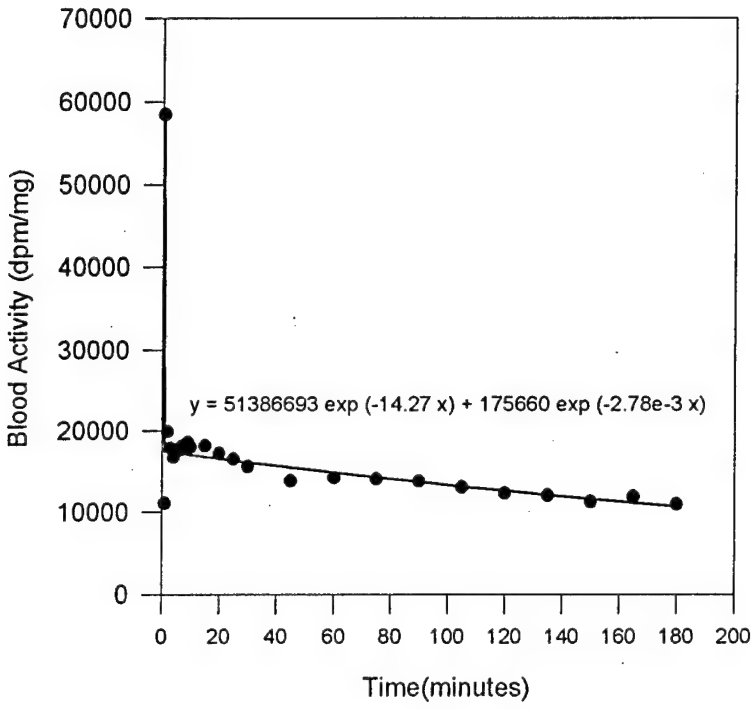

Figure 21: Blood Clearance for Experiment 950906.

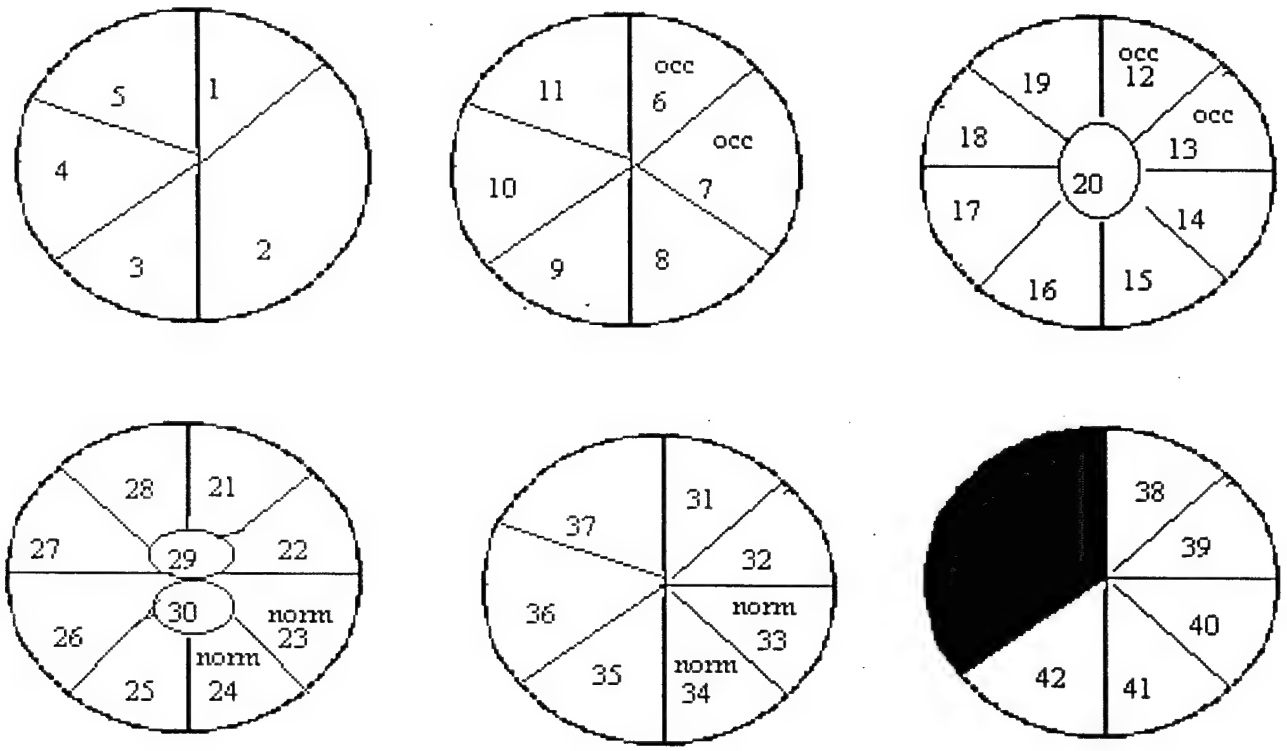

Figure 23: Dissection of the Heart for Experiment 950906. TLD placement for normal region is marked with 'norm' and TLD placement for ischemic (occluded) region is marked with 'occ'.

TABLE 23

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950906

Segment	Segment	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath in dpm			
Number	Mass-g	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
1	4.9E-02	1.29E+05		4.92E+02	1.86E+03	2.67E+04		0	0	2.51E+05	0.00E+00	7.94E+02	3.01E+03
2	4.6E-02	1.22E+05		3.42E+01	2.06E+03	3.13E+04		0	0	2.47E+05	0.00E+00	5.52E+01	3.33E+03
3	3.6E-02	1.13E+05		6.69E+02	2.22E+03	2.60E+04		1.3	4.5	2.24E+05	0.00E+00	1.08E+03	3.59E+03
4	3.8E-02	6.73E+04		1.08E+03	2.28E+03	2.28E+04		0	1.5	1.45E+05	0.00E+00	1.74E+03	3.67E+03
5	3.3E-02	6.85E+04		5.83E+02	2.20E+03	2.10E+04		0	0	1.44E+05	0.00E+00	9.40E+02	3.55E+03
6	5.4E-02	9.38E+04		1.36E+03	2.54E+03	3.23E+04		4.3	0.5	2.03E+05	0.00E+00	2.19E+03	4.10E+03
7	5.4E-02	1.06E+05		3.62E+01	2.78E+03	3.40E+04		0	0	2.25E+05	0.00E+00	5.84E+01	4.49E+03
8	4.8E-02	7.74E+04		6.64E+01	2.31E+03	2.53E+04		0	0	1.65E+05	0.00E+00	1.07E+02	3.72E+03
9	1.1E-01	2.21E+05		5.23E+03	4.72E+03	5.59E+04		3.3	5.5	4.47E+05	0.00E+00	8.43E+03	7.62E+03
10	7.4E-02	1.22E+05		4.13E+03	3.31E+03	4.10E+04		4.1	0	2.63E+05	0.00E+00	6.67E+03	5.34E+03
11	5.5E-02	9.49E+04		2.07E+03	3.46E+03	3.16E+04		0.4	0.5	2.04E+05	0.00E+00	3.34E+03	5.59E+03
12	6.2E-02	1.17E+05		1.09E+03	2.85E+03	3.29E+04		0	0	2.42E+05	0.00E+00	1.76E+03	4.59E+03
13	7.2E-02	1.54E+05		8.54E+01	3.77E+03	4.40E+04		0	3.5	3.20E+05	0.00E+00	1.38E+02	6.09E+03
14	5.9E-02	9.19E+04		1.34E+02	2.94E+03	2.81E+04		0	0	1.94E+05	0.00E+00	2.16E+02	4.74E+03
15	5.9E-02	1.11E+05		2.47E+03	2.07E+03	3.03E+04		1.5	0	2.28E+05	0.00E+00	3.98E+03	3.33E+03
16	1.4E-01	3.66E+05		8.09E+03	6.08E+03	7.88E+04		21.6	5.4	7.18E+05	0.00E+00	1.31E+04	9.81E+03
17	6.3E-02	1.09E+05		3.58E+03	2.54E+03	3.79E+04		5.2	0.5	2.37E+05	0.00E+00	5.78E+03	4.10E+03
18	8.1E-02	1.29E+05		4.36E+03	3.63E+03	4.35E+04		13.6	8.5	2.78E+05	0.00E+00	7.06E+03	5.86E+03
19	5.7E-02	1.07E+05		2.97E+03	2.75E+03	3.26E+04		0	0.5	2.26E+05	0.00E+00	4.78E+03	4.43E+03
20	2.5E-02	7.33E+04		1.34E+01	2.58E+03	2.16E+04		0	0	1.53E+05	0.00E+00	2.16E+01	4.16E+03
21	5.6E-02	1.03E+05		3.07E+03	2.14E+03	4.29E+04		4.1	0.5	2.36E+05	0.00E+00	4.96E+03	3.45E+03
22	7.5E-02	1.49E+05		3.06E+03	3.22E+03	5.35E+04		0	0	3.26E+05	0.00E+00	4.94E+03	5.20E+03
23	8.3E-02	1.87E+05		2.24E+02	2.79E+03	5.69E+04		0	3.5	3.94E+05	0.00E+00	3.60E+02	4.50E+03
24	8.0E-02	1.50E+05		1.91E+03	2.71E+03	5.79E+04		3.4	3.5	3.35E+05	0.00E+00	3.09E+03	4.38E+03
25	1.3E-01	3.46E+05		6.66E+03	4.83E+03	7.62E+04		11.9	3.5	6.81E+05	0.00E+00	1.08E+04	7.80E+03
26	7.8E-02	1.33E+05		4.55E+03	3.37E+03	4.74E+04		8	0	2.90E+05	0.00E+00	7.35E+03	5.44E+03
27	7.4E-02	1.42E+05		4.06E+03	3.09E+03	4.13E+04		7.2	0	2.95E+05	0.00E+00	6.56E+03	4.99E+03
28	5.4E-02	1.04E+05		3.15E+03	2.28E+03	3.30E+04		10.5	0	2.21E+05	0.00E+00	5.10E+03	3.67E+03
29	3.3E-02	6.58E+04		2.24E+01	1.53E+03	1.56E+04		2	0	1.31E+05	0.00E+00	3.94E+01	2.46E+03
30	3.9E-02	6.72E+04		1.23E+03	1.67E+03	2.39E+04		0	3.5	1.47E+05	0.00E+00	1.99E+03	2.70E+03
31	5.8E-02	1.08E+05		3.49E+03	2.18E+03	3.73E+04		4.3	0	2.34E+05	0.00E+00	5.64E+03	3.52E+03
32	7.6E-02	1.70E+05		3.57E+03	3.06E+03	5.48E+04		0	0	3.62E+05	0.00E+00	5.75E+03	4.93E+03
33	7.9E-02	1.71E+05		2.22E+03	2.16E+03	5.16E+04		0	0	3.60E+05	0.00E+00	3.59E+03	3.49E+03
34	7.5E-02	1.40E+05		3.51E+03	2.45E+03	4.98E+04		2.1	15.5	3.07E+05	0.00E+00	5.67E+03	3.98E+03
35	1.0E-01	2.70E+05		4.86E+03	3.65E+03	6.44E+04		12.5	0	5.40E+05	0.00E+00	7.86E+03	5.89E+03
36	6.7E-02	2.76E+05		3.00E+03	2.34E+03	3.87E+04		7.1	3.5	5.08E+05	0.00E+00	4.85E+03	3.78E+03

TABLE 23 - CONTINUED

HEART SEGMENT ACTIVITIES FOR EXPERIMENT 950906

Segment Number	Segment Mass-g	Tissue Readings in cpm				Bath Readings in cpm				Summation of Tissue and Bath Activity in dpm			
		Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95	Tc-99m	Cr-51	Ru-103	Nb-95
37	7.3E-02	3.44E+05		4.24E+03	3.05E+03	4.77E+04		6.9	2.5	6.32E+05	0.00E+00	6.84E+03	4.92E+03
38	1.0E-01	8.66E+05		4.68E+03	2.87E+03	4.06E+04		0	0	1.46E+06	0.00E+00	7.54E+03	4.62E+03
39	1.4E-01	6.87E+05		5.68E+03	3.70E+03	6.36E+04		0	0	1.21E+06	0.00E+00	9.16E+03	5.97E+03
40	1.1E-01	4.58E+05		3.85E+03	2.48E+03	6.73E+04		0	6.5	8.47E+05	0.00E+00	6.21E+03	4.01E+03
41	1.4E-01	7.05E+05		5.55E+03	3.45E+03	7.60E+04		0	5.5	1.26E+06	0.00E+00	8.94E+03	5.57E+03
42	1.1E-01	7.86E+05		2.37E+03	1.85E+03	5.04E+04		3.7	5.5	1.35E+06	0.00E+00	3.82E+03	2.99E+03
43										0.00E+00	0.00E+00	0.00E+00	0.00E+00
44										0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	3.03E+00									1.72E+07	0.00E+00	1.83E+05	1.93E+05

TABLE 24

REFERENCE BLOOD ACTIVITY

(Experiment 950906)

Microshpere Blood Counts		
Cr-51	Ru-103	Nb-95
	3.40E+03	2.19E+03
	3.88E+03	2.38E+03
	6.12E+03	9.27E+02
	2.45E+03	1.92E+03
	3.47E+03	2.09E+03
	1.63E+03	1.95E+03
	1.03E+04	1.95E+03
	7.58E+03	1.92E+03
	5.38E+03	2.19E+03
	9.54E+03	2.02E+03
	8.57E+02	2.05E+03
	5.39E+02	2.21E+03
	5.86E+02	2.12E+03
	6.48E+02	2.05E+03
	6.41E+02	2.02E+03
	9.86E+02	2.22E+03
	8.57E+03	2.12E+03
	1.18E+04	2.62E+03
	3.93E+02	1.81E+03
	8.37E+02	3.01E+03
	3.24E+02	2.31E+02
		1.36E+03
Totals: 0.00E+00	7.99E+04	4.33E+04
Activity(dpm): 0.00E+00	1.29E+05	6.99E+04
Volumes(ml):	**5.20E+00**	**6.10E+00**

TABLE 25

ABSOLUTE FLOWS AND TC-99m DISTRIBUTION IN MYOCARDIUM

(Experiment 950906)

Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51(a)	Ru-103	Nb-95	Segment Number	Normalized Tc-99m	Absolute Flows (ml/min/g) Cr-51(a)	Ru-103	Nb-95
1	8.99E-01	0.00E+00	2.18E-01	1.78E+00	**33**	8.00E-01	0.00E+00	6.10E-01	1.29E+00
2	9.43E-01	0.00E+00	1.61E-02	2.10E+00	**34**	7.19E-01	0.00E+00	1.02E+00	1.54E+00
3	1.09E+00	0.00E+00	4.04E-01	2.90E+00	**35**	9.30E-01	0.00E+00	1.04E+00	1.68E+00
4	6.72E-01	0.00E+00	6.14E-01	2.81E+00	**36**	1.58E+00	0.00E+00	9.12E-01	1.29E+00
5	7.68E-01	0.00E+00	3.83E-01	3.13E+00	**37**	1.40E+00	0.00E+00	7.88E-01	1.10E+00
6	6.62E-01	0.00E+00	5.46E-01	2.21E+00	**38**	1.57E+00	0.00E+00	8.53E-01	1.15E+00
7	7.32E-01	0.00E+00	1.45E-02	2.42E+00	**39**	2.24E+00	0.00E+00	4.85E-01	8.21E-01
8	6.06E-01	0.00E+00	3.00E-02	2.26E+00	**40**				
9	7.48E-01	0.00E+00	1.08E+00	2.11E+00	**41**				
10	6.25E-01	0.00E+00	1.21E+00	2.10E+00	**42**				
11	6.52E-01	0.00E+00	8.16E-01	2.95E+00	**43**				
12	6.85E-01	0.00E+00	3.82E-01	2.15E+00	**44**				
13	7.81E-01	0.00E+00	2.57E-02	2.46E+00	**45**				
14	5.77E-01	0.00E+00	4.93E-02	2.34E+00	**46**				
15	6.80E-01	0.00E+00	9.08E-01	1.64E+00	**47**				
16	8.94E-01	0.00E+00	1.25E+00	2.02E+00	**48**				
17	6.62E-01	0.00E+00	1.23E+00	1.89E+00	**49**				
18	6.03E-01	0.00E+00	1.17E+00	2.11E+00	**50**				
19	6.96E-01	0.00E+00	1.13E+00	2.26E+00	**51**				
20	1.08E+00	0.00E+00	1.16E-02	4.84E+00	**52**				
21	7.41E-01	0.00E+00	1.19E+00	1.79E+00	**53**				
22	7.64E-01	0.00E+00	8.85E-01	2.01E+00	**54**				
23	8.34E-01	0.00E+00	5.84E-02	1.58E+00	**55**				
24	7.36E-01	0.00E+00	5.20E-01	1.59E+00	**56**				
25	9.28E-01	0.00E+00	1.12E+00	1.76E+00	**57**				
26	6.54E-01	0.00E+00	1.27E+00	2.03E+00	**58**				
27	7.01E-01	0.00E+00	1.19E+00	1.96E+00	**59**				
28	7.19E-01	0.00E+00	1.27E+00	1.98E+00	**60**				
29	6.99E-01	0.00E+00	1.60E-02	2.17E+00	**61**				
30	6.62E-01	0.00E+00	6.85E-01	2.01E+00	**62**				
31	7.08E-01	0.00E+00	1.31E+00	1.76E+00	**63**				
32	8.37E-01	0.00E+00	1.02E+00	1.89E+00	**64**				

(a) First set of microspheres were unable for experiment

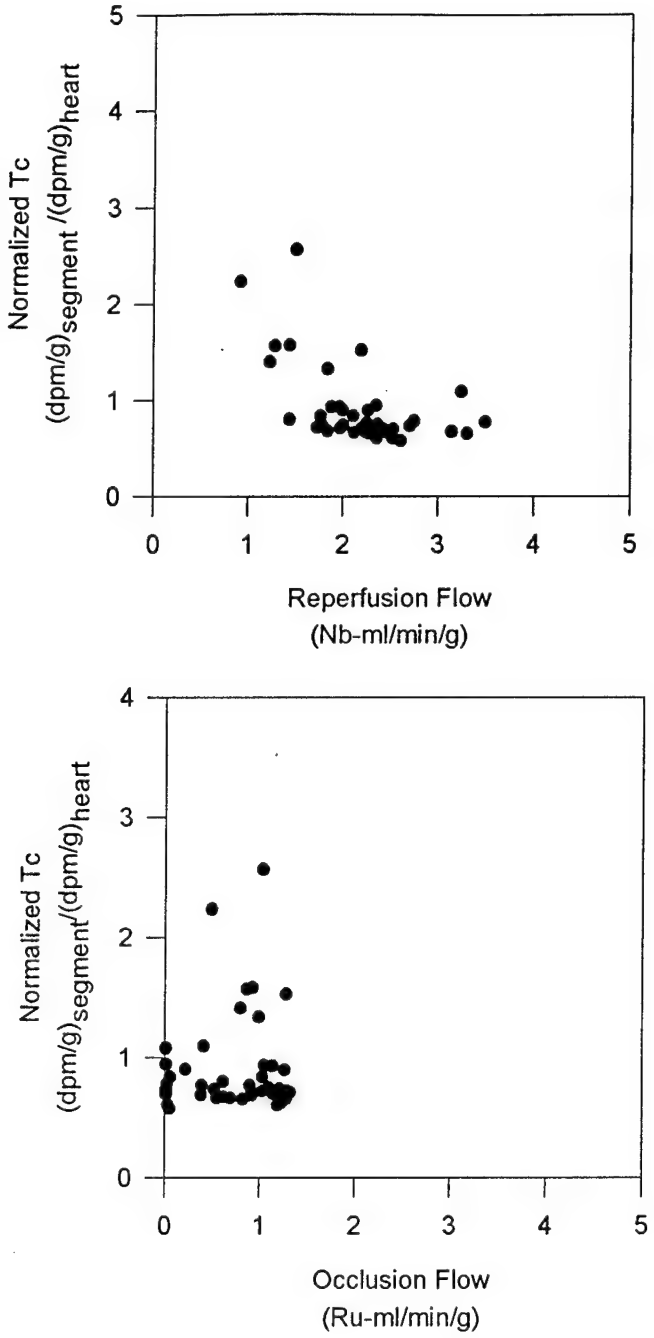

Figure 25: Above graphs are comparisons of Tc-99m distribution in each heart segment to the reference blood flows in the segment for Experiment 950906. a. Plot of normalized Tc vs reperfusion flow b. Plot of normalized Tc vs occlusion flow

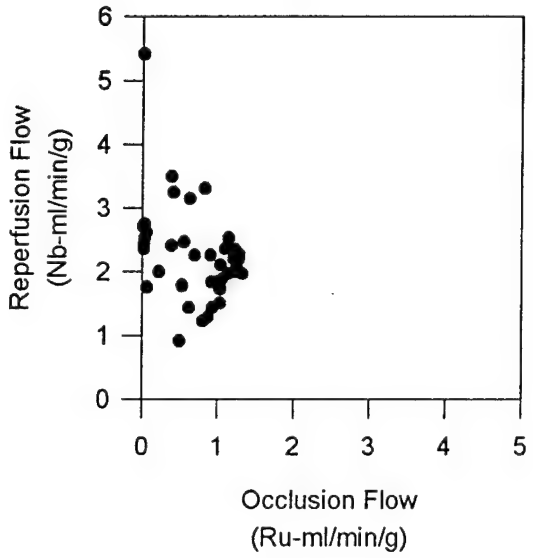

Figure 24: The above plot is for Experiment 950906 and shows reperfusion flow vs occlusion flow. Plots for comparing normal flow with occlusion and reperfusion flows were not accomplished since microspheres were unavailable for normal flow.

BIOGRAPHICAL SKETCH OF AUTHOR

Terrance A. Harms, a Captain in the United States Air Force, was born in Sioux Falls, South Dakota on January 17, 1965. He obtained his high school education at Chester Area High School in Chester, South Dakota. In December 1987, he was awarded a Bachelor of Science degree in Engineering Physics from South Dakota State University in Brookings, South Dakota and commissioned into the United States Air Force. After seven years of active duty, the United States Air Force selected him for post-graduate studies at University of Massachusetts-Lowell. This document completes his work for the degree of Master of Science in Radiological Sciences and Protection.

w-Z0137 - SECURITY - YOU MAY NOT UPDATE ON THIS SCREEN
136 TRANSCRIPT DISPLAY Harms, Terrance, A.
INST: UL
SCREEN: SID: 503909981 CAREER: G

---------- 1994 FALL ----------

Admitted Program:
COLLEGE OF ARTS & SCIENCES
MASTER OF SCIENCE
Major: RADIOLOGICAL SCI & PROTECTION

98	501101	RAD SAFETY CONTRO	A	4.00	16.00
98	581201	MATH METHODS OF R	A	3.00	12.00
98	711201	GRAD SEM RAD SCI	S	1.00	0.00
19	510201	INDUSTRIAL HYGENE	A	2.00	8.00
19	511801	IND HYGENE SAMPLI	A	1.00	4.00

	AHRS	EHRS	QHRS	QPTS	GPA
Current	11.00	11.00	10.00	40.00	4.000

TOTAL PAGES: 006 THIS PAGE: 002 NEXT PAGE:

W-Z0137 - SECURITY - YOU MAY NOT UPDATE ON THIS SCREEN
136 TRANSCRIPT DISPLAY Harms, Terrance, A.
INST: UL
SCREEN: SID: 503909981 CAREER: G

	Cumulative	11.00	11.00	10.00	40.00	4.000

---------- 1995 SPRING ----------

98	502101	RAD SAFETY & CONT	A	4.00	16.00
98	506101	NU INSTRUMENTATIO	A	4.00	16.00
98	572201	RADIATION BIOLOGY	A	3.00	12.00
98	582201	NUMERICAL METHODS	A	3.00	12.00
98	596201	MEDICAL PHYSICS	A	3.00	12.00

	AHRS	EHRS	QHRS	QPTS	GPA
Current	17.00	17.00	17.00	68.00	4.000
Cumulative	28.00	28.00	27.00	108.00	4.000

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SCREEN: SID: 503909981 CAREER: G

---------- 1995 FALL ----------

98	541201	RADIOCHEMISTRY	A	3.00	12.00
98	543801	RADIOCHEMISTRY LA	AU	(1.00)	0.00
98	531201	RADIATION DOSIMET	A	3.00	12.00
98	711201	GRAD SEMINAR RAD	S	1.00	0.00
98	516201	INTERNAL RAD DOSI	A	3.00	12.00
98	673801	GRAD REACTOR HP I	S	3.00	0.00
98	677801	GRAD MEDIACL PHYS	S	3.00	0.00

	AHRS	EHRS	QHRS	QPTS	GPA
Current	17.00	16.00	9.00	36.00	4.000
Cumulative	45.00	44.00	36.00	144.00	4.000

W-Z0137 - SECURITY - YOU MAY NOT UPDATE ON THIS SCREEN
136 TRANSCRIPT DISPLAY Harms, Terrance, A.
INST: UL
SCREEN: SID: 503909981 CAREER: G

---------- 1996 SPRING ----------

98	514201	EXTERNAL RAD DOSI	A	3.00	12.00
98	532201	INTRO NUC RAD SHI	A	3.00	12.00
98	746705	MASTER'S THESIS -	PR	(6.00)	0.00
19	517201	PHYSICAL AGENTS E	A	3.00	12.00
98	522201	ENV RAD & NUC SIT	A	3.00	12.00

	AHRS	EHRS	QHRS	QPTS	GPA
Current	18.00	12.00	12.00	48.00	4.000
Cumulative	63.00	56.00	48.00	192.00	4.000

** End of Graduate Record **

TOTAL PAGES: 006 THIS PAGE: 005 NEXT PAGE: